

KEMENTERIAN PENGAJIAN TINGGI

KOLEJ KOMUNITI M A L A Y S I A

TOURISM & HOSPITALITY FOODSERVICE SANITATION

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PREFACE



"Tourism & Hospitality: Foodservice Sanitation" book is written as a reference for Polytechnic students who major in Foodservice course. Thus, the presence of this book will help improve the students' knowledge which can be applied in the practical classes.

ABSTRACT

This book provides a valuable window on information about sanitation and covers the necessary components from the basic general introduction, microbiology functions and effects in foodservice, causes and preventions of food contamination and poisoning, food safety system as well as the public health law. The provided information equips students with general knowledge and application for the practical classes.

Acknowledgement

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CONTENT INTRODUCTION 02 MICROBIOLOGY FOOD CONTAMINATION **& FOOD POISONING 4 PREVENTIVE METHOD** FOOD SAFETY SYSTEM PUBLIC HEALTH LAW

INTRODUCTION TOPIC 1

WHY?



We need to learn SANITATION



More than just CLEANLINESS:

It is **HYGIENIC PRACTICES** addressed at every stage of food handling process to prevent contamination which may cause food spoilage & food borne illness.



PROTECTION

Important in FOOD INDUSTRY which able to protect the QUALITY & SAFETY of food product as well as protect the consumer HEALTH.

Foodservice Operation

1.Purchasing

 6. Serving / Packing / Delivery

6. Storage
 (Finished Goods)

5. Processing & Production

- Cooking
- Frying
- Baking

2. Receiving

3. Storage(Raw Material)

4. Preparation
 & Handling

- Cutting
- Cleaning
- Thawing

Gain customer satisfaction & trust. Controlled foodborne illness – reduce public health risks.

Good business reputation & global market. Importance of Sanitation Improve quality and increase shelf life of product.

1

Provide clean
& safety working environment.
Reduce product waste.

Compliance with the requirement of law / inspection; •GMP •HACCP •GHP

SANITATION IN ISLAMIC PERSPECTIVE

In Islam, cleanliness and purification are not only requirements for the performance of worship, or when embracing Islam, but are part of a Muslim's very faith.

Allah SWT says in the Qur'an: **"Truly,** Allah loves those who turn unto Him in repentance and loves those who purify themselves (by taking a bath and cleaning and washing thoroughly their private parts, bodies, for their prayers etc.)." (Al Baqarah: 222).

The concept of halal food is incomplete without coupling it with aspects of hygiene and nutrition. From a holistic perspective, food must be halal, safe for human consumption and carries a high nutritional value.

Allah SWT says in the Qur'an: "O mankind, eat from whatever is on earth [that is] lawful and good and do not follow the footsteps of Satan. Indeed, he is to you a clear enemy". (Al Baqarah: 168)

Prophet's sayings (hadith) in this regard are: "Purity is half of faith".

Prophet Muhammad SAW also mentioned in hadith: God is good, loves good, clean, loves cleanliness, cream, loves generosity, loves the good, and cleanse you.

(Narrated by al-Tirmidhi, 2723)

THE DIFFERENCE:

SANITATION

Cleaning is considered to be the use of mechanical agitation and detergents to remove visible soil, biofilms, and other residual soils from the surfaces of equipment, floors, walls, and other locations in a production
facility. Involved cleaning on external part.
Clean on physical dirt only which cover on surface.
Consist of 3 steps :(wash, soap and rinse).
Cleaning agent : soap / detergent.

CLEANLINESS

MICROBIOLOGY TOPIC 2





Bacteria is one of the most important biological foodborne hazards in any food establishment. Bacteria were reported in more cases of foodborne illness than any other hazard.



Yeast are small, lemon-shaped single cells that are about the same size as red blood cells. They multiply by budding a double cell off from the original cell. Scars can be seen on the surface of the yeast cell where buds have broken off.



Fungi can be single celled or very complex multicellular organisms. Fungi are subdivided on the basis of their life cycles, the presence or structure of their fruiting body and the arrangement of and type of spores (reproductive or distributional cells) they produce.



Virus that cause foodborne disease differ from foodborne bacteria in several ways. Viruses are much smaller than bacteria and they require a living host (human,animal) in which to grow and reproduce. Viruses do not multiply in foods. However, a susceptible person needs to consume only a few viral particle in order to experience an infection.

BACTERIA: CHARACTERISTIC



Living, single-celled microbes that require food, moisture, & warmth to multiply.

R

Some form spores : help bacteria survive when too hot, cold, acidic & not enough food.

Some spoil food; others cause disease.

Some cause illness by producing toxins.

Differ in their requirement for oxygen.

X

The reproduction of bacteria and an increase in the number of organisms is referred to as bacterial growth. **Binary Fission** is a process when bacteria reproduce starting from one bacterial cell and then divides to form two new cells.





Inoculation

- □ The **first phase** is the lag phase in which the bacteria exhibit little or no growth. The bacteria adjust to their surroundings during the lag phase. The lag phase lasts only a few hours at room temperature. However, the duration of this phase can be increased by keeping foods at 41°F (5°C) or below.
- The **second phase** of bacterial growth is the log phase. Bacterial growth is very rapid during the log phase with bacteria doubling in numbers every few minutes. Keeping bacteria from reaching the log phase of growth is critical for food safety.
 - The **third phase** of bacterial growth is the stationary phase. The number of new bacteria being produced equals the number of organisms that are dying off during this place. The bacteria have use up much of the space, nutrients, and moisture in the food by this phase of the growth curve.
 - The **final phase** in the growth curve is the decline phase. Here bacteria die off rapidly because they lack nutrients and are poisoned by their own toxic wastes.

Most bacteria prefer foods that are **high in protein or carbohydrates**.



Most disease-causing bacteria can grow within a temperature range of **41°F (5°C) to 135°F (57°C)**. This is commonly referred to as the Food Temperature Danger Zone.

Danger

Zone

Don't

exceed

2 hours

Poultry, Stuffing, Casseroles

Egg Dishes, Ground Meats

Ham, fully cooked, to reheat

Beef, Pork, Lamb, Veal,

Roasts, Steaks, Chops

Reheat Food above

165 deg F within

2 hours and keep

above 140 deg F

until Served

Reheat Leftovers

Bacteria also differ in their requirements for oxygen.

<u>Aerobic</u> needs oxygen to grow - example: *Bacillus cereus* (found in rice).

Anaerobic grows only when oxygen is absent - example: *Clostridium* (vacuum packed refrigerated food).

Facultative Anaerobic can

grows with / without free oxygen - example: *Staphylococcus*

Anaerobic bacteria do not require oxygen for growth.

(human contact).

FOOD

TEMPERATURE

WHAT BACTERIA NE

165 F 74 C

160 F 71 C

145 F 63 C

140 F 60 C – Holding Temp. for Cooked Food

Refrigerator

Temperature 40 F 4 C

Temperature 0 F - 18 C

Freezer

RATURE •

TIME

Most bacteria prefer a neutral environment (pH of 7.0) but are capable of growing in foods that have a **pH in the range of 4.6 to 9.0**.



ACIDITY

Under ideal conditions, bacterial cells can **double** in number **every 15 to 30 minutes**. For most bacteria, a single cell can generate over 1 million cells in just 5 hours. Proper storage and handling of food helps to prevent bacteria from multiplying.

OXYGEN

*

Bacterial activity based on amount of "water available", NOT "water by volume.

MOISTURE

Water Activity (Aw) is a measure of the available water in a food. Aw measured on a scale from 0 - 1.0.

Most potentially hazardous foods have a <u>water activity</u> (*Aw*) of .85 or above.



*





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VIRUS: CHARACTERISTIC

Viruses are smaller than bacteria, size between 20-300 nanometer (nm) and surrounded by a protein coat called the capsid.

The capsid function to protects nucleic acid from inactivation by the outer physical conditions.

Viruses are divided into three groups, based on the morphology of the nucleocapsid and the arrangement of capsomeres.

Viruses lack of nucleus, cytoplasm and cellular organelles, such as mitochondria and ribosomes.

Viruses contain only one type of nucleic acid, either DNA or RNA, but never both.

Viruses need living cell (host cell) to survive through replication of their nucleic acid and synthesis of the viral protein.

FUNGI: CHARACTERISTIC

Fungi are **multicellular** with the exception of yeast and found everywhere, usually invisible to the naked eye.



Mostly free-living, living in the soil, air and dead matter.



They are **heterotrophs**; they obtain food from other organisms.

X

Most feed on dead organisms, i.e. are **saprotrophic** or by absorbing nutrients from decaying matter in the soil (decomposers).



Some are **parasitic** (absorbing nutrients from the hosts) and can cause illness – e.g. thrush (candidiasis) in babies mouth and athlete's foot (Tinea) in humans toes cause crack & flake skin, and rust in plants.



Some live in symbiotic relationships with plants and animals, e.g. lichen (a combination of fungi and algae), and mycorrhizae.



FUNCTION OF MICROORGANISM

BACTERIA

- •Lactobacillus acidophilus one of the most commonly used probiotics which produce yogurt drink.
- •Acetobacer reacts with ethanol to produce vinegar.
- •Lactobacilus casei used to produce cheese.

VIRUS

• Sacteriophages commonly used for special killing of unwanted bacteria to increase food safety during production process. The control of foodborne pathogens in a process known as "biocontrol". It is act as a tools for detecting pathogenic bacteria throughout the food chain.

Eacteriophages is also been proposed as biopreservatives in food.

FUNG

- Food source:mushrooms.
- Aspergilus oryzae used to produce soy miso.
- Penicillium chrysogenum involved in meat sausage process.
- Penicillium responsible in antibiotic production.
- Rhizopus microspotus used to product soy tempeh.

YEAST

• Saccharomyces cerevisiae plays a key role as a leavening agent in bread making and dough product by producing carbon dioxide through the alcoholic fermentation of sugar thus increased the volume of loaf.

• Saccharomyces cerevisiae also involved in alcohol production / brewing industry when fermentation occurs without air to produce wine.

The perspective in Islamic law of microorganism uses in food production.

Microbial bioprocess based-food products is one of alternative to create a variety of good quality and nutritious food products. These products can be fermented food, nutraceutical, whole microbes, probiotic and synbiotic. The presence of several microbes in gastric intestinal tract will also maintain mictobiota of human gut. Microbial agent is also important on producing the aroma, taste and color. It is also important on modifiving of food materials. As Muslim, people should follow the halal dietary laws. Halal food means any process to be a food product that is permissible of lawful by Islamic laws. It is defined in the holy Quran and the Sunnah of Prophet Muhammad. In general, the microbial based-food products are categorized into halal, haram, harus and doubtful.

Since modern biotechnology is a contemporary issue that may not have any direct explanation in al-Quran and Sunnah, other Islamic sources like *ijmak* should also be referred to (al-Amidi 1968; Anwar 1973) when drawing up this code of ethics. Apart from that, Qawaid Fighiyyah is useful to strengthen the code to achieve the objective of Syariah (Mohammad Hashim 2009b).



Raw materials for food Food ingredi Thickening, gelling

BC	emulsifying, and water-binding agents.	Silver of
St.	Food packing materials Sausage and meat casings	

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Aplikasi	Enzim yang digunakan	Mikrobia	Fungsi
Proses pangan	Amylase	bakteri, kapang	Produksi gula dari pati, seperti pembuatan sirup jagung
	Protease	Bakteri	Menurunkan kandungan protein pada industri biskuit
Pangan bayi	Tripsin	Bakteri	predigest pangan bayi
Bahan pelunak daging	Protease-like papain	Bakteri	Melunakkan daging
Industri pati	Amylase, amyloglucosidase, glucoamylase	bakteri, kapang	Mengubah pati menjadi glukosa pada produksi sirup
	Glucosa isomerase	bakteri	Mengubah gula menjadi fruktosa dalam industri sirup
Jus buah	Selulase dan pektinase	Bakteri	Menjernihkan jus buah
Industri susu	Rennin		Hidrolisis protein pada keju
	Lipase	Bakteri	Produksi keju roquefort agar matang
	Lactase	Bakteri	Menghancurkan laktosa menjadi glukosa dan galaktosa

Table 2.0: Use of microbial enzymes in the food industry

Islamic code of ethic for microbial usage in food

If one cannot find either a passage from the al-Quran or Sunnah bearing on the matter in hand, then one turns to a third source which is Ijma'- the general consensus among Islamic scholar of a particular age in relation to the legal rulings correctly applicable to the situation (al-Amdi 1968; Weeramantry 2001; Mohamad Akram 2006). This definition includes the agreement on all matters pertaining to Islam whether it is in the subject of belief or moral and legal matter (Mohamad Akram 2006). Below is the source of microorganism used in biotechnology arise an issues among islamic scholar:



A decision that has been issued by the National Fatwa Council with regard to Biotechnology

- Sources of adapted bacteria used in the production of foods such as MSG obtained from the intestines of adults is *harus* only if it gone through a process of isolation and purification and required a laboratory test.
- Use of genetic sources that are haram and may harm humans (intoxicated) and give a negative impression to the environment is **not allowed**.
- Sources obtained from plant, lawful animal (cattle, fish, seafood, etc) and slaughter according to sharia are permissible (*halal*).
- Anything from genetic sources obtained from pigs is *haram*. For example the insertion of the gene encoding *c-amylase* from pigs (Feller et al., 1996) and the insertion of the *mrc-1 gene* as an antimicrobial derived from *enterococcus bacteria* from pigs (Hamilton and Wenlock, 2003). 2016).
- The mixing of halal ingredients with transglutaminase enzyme and plasma powder for the preparation of dough for fish balls, it is still categorized as istihalah fasidah (imperfect and unclean) because the blood element still exists in the final product (Ghananim 2008).
- The 62nd Muzakarah (conference) of the Fatwa Committee National Council of Islamic Religious Affairs of Malaysia, held on 16th March 2004, has discussed the ruling on using bacteria extracted from baby faeces as food additive in making yoghurt. The Committee has decided that bacteria culture extracted from any impure items (najis) as additive in yoghurt is lawful on condition that it has gone through a separating and cleaning process that is in line with Shariah requirements. This is because the bacteria in baby faeces which is mutanajjis (impure item) (Majmu'at minal-'Ulama' n.d.).

F O O O POISONING D TOPIC 3



FOOD CONTAMINATION

- Food contamination = Presence of substances or conditions in the food that makes the food is unsafe & unfit for consumption / harmful to humans.
- Refer to foods that are spoiled or contaminated by the foodborne hazard. There are <u>3</u> types of <u>Hazards @ Food</u> <u>Contaminant</u> in a food production process that can contaminated the food.



FOOD POISONING



- Food poisoning is the most common illness associated with eating / consume contaminated food.
- When a substance that is poisonous to human is consumed, food poisoning occurs. Eg; toxins produced by certain types of bacteria.
- It usually arises from improper handling, preparation or food storage.
- Food Poisoning should not be taken lightly as it can cause an outbreak and death.

SYMPTOMS OF FOOD POISONING





Who is more at risk for **FOOD POISONING?**





LOW IMMUNE SYSTEM



PREGNANT WOMEN



KIDS (<5y)

CAUSES of food contamination.

POOR HYGIENE PRACTICE

INDIVIDUAL / PERSONAL:

- Inadequate hand washing
- Unclean apron & uniform
- Long and untrimmed fingernail, hair & beard.

• Infected food handler with Salmonella Typhi

PREMISE / SURROUNDING:

- Unclean working area
 - Table
 - Floor
 - Wall

UTENSIL / EQUIPMENT:

• Unclean utensil, equipment or machine used in food production.

- Chopping board
- Knife

IMPROPER HANDLING

CROSS-CONTAMINATION

• Utensils / equipment used for raw food come In contact with other food such as ready-to-eat (RTE) food.

- Slicing lettuce with a knife used to cut raw poultry.

• Failed to separate cooked items with raw food during storage.

• Food items were sent using unsuitable / dirty transportation.

• Bad habit such as biting nail / taste food with finger.

TIME & TEMPERATURE ABUSE

• Contamination occurs when fruits and vegetables are fertilized with raw manure or when crops are irrigated with water containing traces of animals waste.

• Improperly canned food can form deadly toxins.

• Use bulging cans with rusted lids or cracked, leaking jars for storing food items.

• Using contaminated raw material/food.

• Expose food at the Temperature Danger Zone (TDZ) for more than 2 hours.

- Food prepared too early.
- Not cooking food thoroughly (particularly meat) / undercook.

• Not sufficiently reheating previously cooked food – shorter time & wrong temperature.

• Improper storage (food stored at the unsuitable temperature).

CAUSES of food poisoning.

- Harmful bacteria are the most common cause of food poisoning, but other causes include viruses, parasites, toxins and contaminants.
- Bacteria, Virus, Mold, Toxin are cause for most food poisoning and responsible for the illnesses, hospitalizations, and deaths.
- Toxin is a poison that produced by microorganism such as bacteria.



Food-Poisoning Organisms

Salmonella
 Campylobacter jejuni
 Staphylococcus aureus
 Clostridium spp. (botulinum & perfringens)
 Bacillus cereus
 Eschericia coli (E.coli)
 Listeria
 Vibrio cholerae
 Shigella
 Hepatitis A
 Norovirus



Steps to identify spoiled foods



FIVE SENSES



EFFECT of food contamination



METHODS TO PREVENT FOOD CONTAMINATION TOPIC 4

PREVENTION METHODS of food contamination through INDIVIDUAL SANITATION.



PREVENTION METHODS of food contamination through INDIVIDUAL SANITATION.



PREVENTION METHODS of food contamination through EQUIPMENT SANITATION.

Some foods carry bacteria. Indirect contact between foods can cause cross-contamination.



Use separate utensils and chopping boards for raw and cooked foods

Clean and store utensil & equipment correctly after each use.

The material for utensil & equipment should from non-corrosive material, comes with smooth surface and easy clean design. All the utensil / equipment and surface that come into contact with food must be clean and sanitized regularly.

All sanitized items must be air dry.

Method: 1) **CHEMICAL**: Prepare one teaspoon of bleach / sanitizing agent in a gallon of water.

- 2) RADIATION
- 3) HEAT




PREVENTION METHODS of food contamination through PREMISE SANITATION.

All the area and facilities in premise should be in a clean condition before and after each use.

Establish a routine cleaning schedule and provide cleaning program / schedule in written for the premise.

Perform self-inspection once done with the cleaning activity. FLOOR: Sweep, vacuum and clean. Food spills should immediately clean.

WALL: Clean wall with cleaning solution daily. Ensure no any flaking paint or mold on the wall.

LIGHT: Clean light fixtures with a sponge or cloth. Use light cover to protect from physical hazards.

TABLE: Spray with solution / sanitize and wipe with a clean cloth.

CEILING: Swab and clean to ensure no dust is trapped.

VENTILATION / HOOD: Check and clean regularly.

DRAIN: Ensure the drains are not clogged.

Wiping cloths / sponge must be clean and kept sanitized between every use.

Implement PEST CONTROL program in premise to prevent from any pest / invader.

PURCHASING SANITATION PRACTICE



RECEIVING SANITATION PRACTICE

 Schedule the deliveries to allow adequate time for the proper inspection and receiving of all food products.

Inspect the condition and cleanliness of delivery transportation. Record the temperatures of the delivery trucks refrigerated and freezer storage. Ensure the food items is delivered at correct temperature. If the temperature is not within an acceptable range, do not accept the shipment.

Check the condition and inspect the quality of received items:

- Ensure food free from any contamination such as mold, insect, droppings or foreign objects (glass, metal,paper).
- No any damage or tears on food packaging.
- Check the 'Use by' date of each food items.

Ensure each delivery comes with the complete documentation:

- Delivery order.
- Certificate of Analysis (COA) / Certificate of quality (COQ).

STORAGE RULES

All stored food should be kept wrapped or sealed in container.

Separate the food item based on the types.

3

system (First-In-First-Out).

Store food in date order-use. Apply FIFO

Label each container for better traceability.

Regularly checking and record the temperature of storage area.

6

5

Periodically perform cleaning activity in storage area.

Immediately discard the out of date / spoiled food.

SANITATION PRACTICE (REFRIGERATOR)

REFRIGERATOR RULES



An organized refrigerator can play an important role in food safety, food quality and food waste



- Refrigerators should be set to maintain a temperature of 40 °F or below.
- For safety, it is important to verify the temperature of the refrigerator.
- Be sure refrigerator doors are closed tightly at all times. Don't open refrigerator doors more often than necessary and close them as soon as possible.
- All perishable foods need to be refrigerated within two hours;
 and one hour if it is over 90 degrees Fahrenheit outside.
- Do not overfill the refrigerator, for the cold air circulation purpose.
- Store eggs in their carton, inside the refrigerator where it is colder, not in the door.

SANITATION PRACTICE (DRY STORAGE)



Use the First-In, First-Out (FIFO) principle. Pull old stock to the front and store the new stock behind.

Store foods off the floor and away from walls to allow for adequate air circulation. All food should be stored at least 15 cm (6 inches) off of the floor. Store foods away from sources of heat and light, which decrease shelf life.

Place a thermometer on the wall in the dry storage area. Check the temperature of the storeroom daily.

Store foods away from sources of heat and light, which decrease shelf life.

Keep dry storage areas clean with good ventilation to control humidity and prevent the growth of mold and bacteria.

Store dry foods at 50°F (10°C) for maximum shelf life. However, 70°F (21°C) is adequate for dry storage of most products.

STORAGE SANITATION PRACTICE (FREEZER)

2

4

Ensure that doors have a good seal and close tightly to prevent heat gain. Additionally, keep doors closed as much as possible.

Check the temperature of the freezer on both the built-in and the portable thermometers to ensure that the freezer temperature is below -18,°C (0°F). Immediate take corrective action if temperature is fluctuate.

Ensure that freezers have enough open, slotted shelving to allow for air circulation around shelves and walls to maintain adequate food temperatures.

Properly segregate the food based on types and packed individually or kept in closed container. Ensure each food item complete with label.



PREPARATION & HANDLING SANITATION PRACTICE



Wash your hands before handling food and often during food preparation. Wash your hands every time they are exposed to germs (after going to the toilet, blowing your nose, smoking, handling raw meat/poultry/eggs, touching unclean surfaces, handling trash etc).





Wash, and sanitize all surfaces and equipment used for food preparation.

Utensils especially those from which you eat, drink or in which you cook should not come in touch with raw meat/poultry/eggs.

Protect kitchen areas and food from insects, pests and other animals.

Keep food covered, in closed containers and wherever needed, refrigerated.

PREPARATION & HANDLING SANITATION PRACTICE

Keep food preparation area clean and in good condition (repair cracks, fill holes, do not allow small spaces between fixtures that do not allow cleaning and where dirt and food can accumulate).

Do not neglect the rubbish area. Keep it clean and tidy and remove rubbish daily. Clean and dry all equipment (including the cleaning equipment) as germs can grow fast in damp places.

* Raw food, especially, meat, poultry and seafood and their liquids can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

Separate raw and cooked

Separate raw meat, poulty and seafood from other foods at all stages from cleaning, storing, preparation, and cooking.

Use separate equipment, utensils (including washcloth) for handling raw foods meats, poultry and seafoods.

Use them for other foods always only after washing with hot water and soap.

Do not let juices or liquids from raw meats, poultry and seafoods to spill or seep onto other surfaces or come into contact with cooked or other raw foods.

Store foods in covered containers to avoid cross-contamination between raw and prepared foods.



PREPARATION & HANDLING SANITATION PRACTICE

* Proper cooking can kill almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. * Microorganisms can multiply very quickly if food is stored at room temperature. By holding food at temperatures below 5°C or above 60°C their growth is slowed down or stopped.





Store food at safe temparatures

Ensure food is thoroughly cooked through, especially meat, poultry, eggs and seafood.

Juices from meats, seafood and poultry should not be pink, and should be clear.



Do not leave cooked food at room temperatures for more than 2 hours.

Refrigerate all cooked and perishable foods promptly.

Keep cooked food very hot (above 60°C) prior to serving Do not store food too long (more than 3 days) in the refrigerator.

Do not reheat refrigerator food more than once.

Do not refreeze frozen food after thawing or cooking.

PREPARATION & HANDLING SANITATION PRACTICE



Use safe water and raw materials.

Use safe water or treat it (by boiling, chlorination, and filtration) to make it safe for cooking, washing hands or utensils, and making drinks or ice.

Select fresh and wholesome foods (not damaged or rotting) from clean stores / places.

Wash fruits and vegetables, especially if eaten raw.

Cut away damaged or bruised parts of fruits and vegetables, since bacteria can thrive in these places.

Do not use food beyond their expiry date.

*Raw materials, including water and ice, may be contaminated with dangerous chemicals or microorganisms. Toxic chemicals may be formed in damaged and mouldy foods. Select raw materials with care. Simple measures such as washing and peeling may reduce risk.

SERVING & PACKAGING SANITATION PRACTICE

HOW TO SERVE FOOD HYGIENICALLY **Good Personal Hygiene**





Keep fingernails short and clean.



Cover cuts and sores completely with brightly coloured waterproof dressing.



Wash hands thoroughly with soap and water: after using the toilets;
 before and after serving food; - after clearing the table; and - after handling rubbish.



Use tongs, ladles or spoons to handle cooked/ready-to-eat food.



Wear clean disposable gloves to clear table. Wash your hands thoroughly with soap and water after clearing/cleaning the table.



Use a food tray when serving food/drinks. Use a different tray to collect used utensils.



Keep the dining environment clean and do not sweep crumbs or remnants onto the floor.



Provide serving spoons to patrons who are sharing dishes.



Do not use crockery and utensils that are chipped. broken or cracked.



Handle crockery and utensils by the base or handle.



Ensure fingers are not touching the food.





Do not wear iewellerv at work.



Do not touch your hair/face when handling food.



Do not work if you are unwell.

SERVING & PACKAGING SANITATION PRACTICE

1	Ensure the preparation, packaging or serving of food is free from any contamination.
2	Ensure that food packaging provides adequate protection adequate for food products to minimize contamination and avoid damage to the food produce.
3	Ensure that food packaging materials are non -toxic and strong enough to withstand tears and leaks.
4	Ensure that food packaging materials are not affected safety and suitability of food under storage conditions and prescribed use.
5	Do not use unlined hands to operate any unpackaged food and take all reasonable steps to prevent customers from using unlined hands to handling any unpackaged food.
6	Wipe hands with a clean towel or any other material others that are clean and appropriate.
7	Ensure that the food heater maintains the temperature of the food at temperature exceeds 60°C, if the food to be served is hot.
8	Ensure that any food to be served is cold refrigerated as soon as possible if the process heating is used or at a temperature that does not pose a risk to health, if no heating process is applied at the final stage preparation.

WASTE MANAGEMENT SANITATION PRACTICE

Waste disposal must be done in a way which can prevent food contamination starting from raw materials until the finished product, water can drunk and should not give any disturbance to the environment.

Appropriate provision must be made for disposal and storage of waste materials.

Waste materials must not collected in food handling areas, food storage and other work spaces and in the surrounding area unless it is not possible avoided.

Storage containers and material collection areas waste must be properly cleaned and disinfected regularly.

All food waste, inedible by -products and other waste shall be stored in covered containers or other suitable types of containers and kept in good condition, easy to clean and if necessary, disinfected.





Overall, it can be said that, due to haphazard disposal and improper management of waste, the environment as well as human health is at high risk of disease transmission in future.

QUALITY CONTROL SYSTEM & FOOD SAFETY

TOPIC 5

THE MEANING OF GMP AND GHP IN FOODSERVICE INDUSTRY.

GOOD MANUFACTURING PRACTICE (GMP)

GMP is Universal measures that control the operation of a food premises to enable the production of safe food.

GMP are the basic operational and environmental conditions required to produce safe foods. They ensure that ingredients, products and packaging materials are handled safely and that food products are processed in a suitable environment.

GMPs address the hazards associated with personnel and environment during food production. They provide a foundation for any food safety system.

Once GMPs are in place, processors can implement a Hazard Analysis Critical Control Point (HACCP) system to control hazards that may affect the ingredients and packaging material during food processing.



Food Safety

MALAYSIA

THE MEANING OF GMP AND GHP IN FOODSERVICE INDUSTRY.

GOOD HYGIENE PRACTICE (GHP)

Good Hygienic Practices (GHP) deal with safety and suitability requirements to be followed world-wide.

GHP include all practices regarding the conditions and measures necessary to ensure it.

GHP in foodservice industry pertains to the practices related to food management and cooking to prevent food contamination, prevent food poisoning and minimize the transmission of disease to other foods, humans or animals.

GHP specify safe ways to handle, store, prepare, serve and eat food.



GHP include:

• Cleaning and sterilization of food-preparation areas and equipment (for example using designated cutting boards for preparing raw meats and vegetables).

• Proper storage of food so as to prevent contamination by vermin.

• Refrigeration of foods (and avoidance of specific foods in environments where refrigeration is or was not feasible).

• Proper disposal of uneaten food and packaging.



FUNCTIONS AND INTERRELATIONSHIP OF PEOPLE, EQUIPMENT, PROCESS AND ENVIRONMENT IN PRACTICING GMP AND GHP

The place, Primary Materials, people, process and product are five important factors of production and processing of food product that affect the quality and safety while following GMPs and GHP.

Places and premises must be clean and well organized. All surfaces and roofs, side walls should be well cleaned and designed to prevent any kind of contamination.

People who are working in the industry must be well qualified with the help of education, training, workshops, experience and seminars. People of Quality Assurance department are responsible to send each product for sale, release raw material and packaging components for use, approve operational procedures, master formulas and specifications, review returns prior tore sale, and also investigate each complaint.

In Processes Sanitation programs include documented procedures for effective cleaning of the premises, equipment, handling of substances, and the health and hygienic behavior of personnel.

The 5 P's of Good Manufacturing Practices (GMP)



People

Comprehend roles and responsibility



Products

Clear specifications at every phase of production



Processes

Properly documented, simple, and consistent



Procedures

Guidelines for undertaking critical processes



Premises

Cleanliness and equipment calibration at all times



LOCATION

Describes the location and layout of premises, or standards of good.

Sketching the layout of food premises according to the flow chart of work in the kitchen.

Briefly lists the processes involved in order to avoid food poisoning caused by the food premises.

Explaining the need for cleaning equipment in the kitchen premises.

Describes ways to prevent food poisoning at the premises.

PREMISES

FOOD PREMISES is the premise of preparing, packaging, preserving, distributing or selling food or drink.

Food premises must have a design and constructed so as to control the risk of contamination.

The area environmentally polluted and industrial activities that indicate a serious threat to food contamination.

Flood prone areas unless control measures are adequate.

Areas that are often attacked by pests.

Areas where materials such as solid and liquid wastes can not be disposed of in an effective.

Layout of the premises to allow better flow of the process, practice good hygiene and safety, including protection and pest attack prevention of cross contamination between the hours of operation and during operation.

Adequate sanitation facilities should be provided.

Loading area should be designed for ease of cleaning works and helping the supervision of food hygiene.

Identify symptoms & causes of food poisoning and knowing the relationship between time, temperature and the growth of microorganisms that cause food poisoning.

Identify and solve problems relating to facilities, equipment and layout of food premises.

Avoid food contamination during food preparation process.

THE DESIGN, LAYOUT AND FACILITIES

Design and facilities elements lay a firm foundation for GMP to ensure food hygiene and should be used in conjunction with each specific code of hygiene.

The design and facilities is the first requirement in the GMP which covers the location, design and layout, floor, walls, ceiling, doors, windows, surfaces in contact with food, water supply, drainage, toilets, changing rooms, personnel hygiene facilities, air quality and ventilation, lighting and storage. Design and facilities of a food-based premise needs to keep sanitation and sanitary design at its core.



THE DESIGN, LAYOUT AND FACILITIES

FLOOR

Easy to be clean.

Should be made from impervious material.

Should be constructed to allow adequate drainage and cleaning.

Not smooth.

Has a bend in the corner between wall and floor-to avoid dust entrainment. Does not absorb dirt.

Corrosion resistant chemical.

Built slightly curved to prevent water retention Gutters can be constructed around the wet processing area (ceramic, stainless steel).







THE DESIGN, LAYOUT AND FACILITIES

WALL

Working surfaces that come into direct contact with food should be in sound condition.

Durable & easy to clean, maintain & disinfect.

Should be made of smooth, non-absorbent materials, inert to food, to detergents & disinfectant.





Ceilings and overhead fixtures should be constructed and finished to minimize the build up of dirt and condensation and the shedding of particles.

Ceiling must be of materials that are not easily absorb moisture.

Must be colored bright.

Smooth and patterned.

Coated with an inert material that is appropriate and PVC layer/ Epoxy paint.

THE DESIGN, LAYOUT AND FACILITIES



DOOR

Smooth, non-absorbent surfaces.

Easy to be clean and disinfect.

Serves to control entry and exit of workers.

It should always be closed to control pollution.

Made from Resistant plastic operations, Stainless steel.

Wood doors with epoxy paint finish / paint lightning in the area apart from the processing area and dry (not very recommended).

WALL

Should be easy to clean.

Be constructed to minimize the build of dirt.

Be fitted with removable and cleanable insect-proof screens.





WATER SUPPLY

An adequate supply of potable water.

With appropriate storage facilities, distribution, temperature control.

Potable water should be as specified in the latest edition of WHO Guidelines for Drinking Water Quality, or water of a higher standard.

Non-potable water (for use in, for example, fire control, steam production, refrigeration and other similar purposes where it would not contaminate food), shall have a separate system.

Non-potable water systems shall be identified and shall not connect with, or allow reflux into, potable water systems.





DRAINAGE & WASTE DISPOSAL

Adequate drainage and waste disposal systems and facilities should be provided.

They should be designed and constructed so that the risk of contaminating food of the potable water supply is avoided.

PERSONNEL HYGIENE FACILITIES AND TOILETS

Adequate means of hygienically washing and drying hands, including wash basins and a supply of hot and cold (or suitably temperature controlled) water; Lavatories of appropriate hygienic design;

Adequate changing facilities for personnel.

Such facilities should be suitably located and designated.





TEMPERATURE CONTROL

Depending on the nature of the food operations undertaken, adequate facilities should be available for heating, cooling, cooking, refrigerating and freezing food, for storing refrigerated or frozen foods, monitoring food temperatures, and when necessary, controlling ambient temperatures to ensure the safety and suitability of food.

AIR QUALITY & VENTILATION

Minimize air-borne contamination of food, for example, from aerosols and condensation droplets;

- → control ambient temperatures;
- → control odours which might affect the suitability of food;
- → control humidity, where necessary, to ensure the safety and suitability of food.

Ventilation systems should be designed and constructed so that air does not flow from contaminated areas to clean areas and, where necessary, they can be adequately maintained and cleaned.

Ventilation is essential to control the accumulation of heat, steam, dirt, smoke and odors.



Ventilation can also cause pollution if not done properly.

Draining the air must have protective netting.

Air openings should be covered with netting.





LIGHTING

Adequate natural or artificial lighting should be provided to enable the undertaking to operate in a hygienic manner.

Where necessary, lighting should not be such that the resulting colour is misleading.

The intensity should be adequate to the nature of the operation.

Lighting fixtures should, where appropriate, be protected to ensure that food is not contaminated by breakages.

Natural and artificial lighting ~ Brightness should be compatible with the operation, a minimum of 215 lux from a distance of 90 cm from floor level.

The light must have a plastic cover.

Plastic cover must be cleaned regularly.

Brightness is measured using lux meter.

SANITATION FACILITIES

Basic facilities for hygiene and sanitation workers and equipment to be provided.

Hand wash sinks and toilets should be provided with sufficient number $10 \sim 1$ employee hand wash sink / toilet.

Wash basins and sinks, a versatile equipment must be separated.

Buffer areas must be established if the toilet is connected directly to the processing area.



RECEIVING/STORAGE OF RAW MATERIAL

Suppliers must be approved supplier for the supply of certain raw materials.

Raw materials and food additives must have Written specifications Certificate of analysis from the supplier ;

- CoA (certificate of analysis).
- CoC (certificate of conformance).
- Certificate of quality assurance and food safety from the supplier (Certificate of GMP, HACCP, Halal certificate, etc).
- ✤ Letter of guarantee.

Raw materials must be retained for at least 15 cm between raw materials and the walls (including the pallet).

Shelves must be prepared at least 20 cm from the wall.

This allows for easy cleaning and pest monitoring.

RECEIVING/STORAGE OF RAW MATERIAL

Where necessary, adequate facilities for the storage of food, ingredients and non-food chemicals (e.g. cleaning materials, lubricants, fuels) should be provided.

Where appropriate, food storage facilities should be designed and constructed to:

- → permit adequate,
- → maintenance and cleaning,
- → avoid pest access and harbourage,
- → enable food to be effectively,
- protected from contamination during storage,
- where necessary, provide an environment which minimizes the deterioration of food (e.g. by temperature and humidity control).

Food should be stored at the height of 20 cm from floor and the width of 15 cm from wall in order to prevent from food contamination and easy to be clean. The type of storage facilities required will depend on the nature of the food.

Where necessary, separate, secure storage facilities for cleaning materials and hazardous substances should be provided.

WASTE AND SEWAGE WASTE MANAGEMENT

Trash must be sufficient and enclosed.

Trash cans on the outside of the premises must be equipped with facilities to wash and have built a simple washing.



CLEANING AND SANITATION PROCEDURES

Adequate facilities, suitably designated, should be provided for cleaning food, utensils and equipment.

Such facilities should have an adequate supply of hot and cold potable water where appropriate.

METHODS OF APPLYING SANITIZERS

Working With Concentrated Chemicals:

- Follow label instructions carefully.
- Always store concentrated chemicals in original container.
- Work with proper dilutions.
- Wear protective equipment recommended by manufacturer.

CLEANING AND SANITATION BASIC STEPS



PRODUCT RECALL PROGRAMME

A recall program is a written action plan that is carefully constructed, tested and evaluated to ensure efficiency.

Safety net that prevent consumers from buying or eating a potentially harmful food product.

Recall is removal of unsafe food from distribution chain. Recall extends to food sold to consumers and involves communication with consumers.

A recall should be initiated when a foodstuff identified as unsafe is a potential risk to public and has been distributed to the consumer.

The purpose of product recall is to protect public health by informing consumers of the presence of a potentially hazardous foodstuff on the market facilitate the efficient, rapid identification removal of unsafe foodstuffs from the distribution chain and ensure that the unsafe foodstuffs are either destroyed or rendered safe.

Lot traceability is prerequisite for effective recall. It is vitally important to be able to trace any potentially unsafe product. Both raw materials and finished products should be traceable.

RECALL PROGRAMME



The requirement of GMP and GHP in Foodservice Industry PEST CONTROL ACTIVITIES

Registered with company that handle the work of eliminating pest.

Supervised the kitchen from contaminated rats and cockroaches.

Make sure the kitchen storage shelves are at least 30cm from the floor to facilitate cleaning and prevent incest breading.

Make sure all food is kept. Covered to use tight storage container to store dry food.

Maintain management system and good hygiene in the kitchen at all time.

Avoid containers that had been left vacant that can harbor rats and cockroach.



THE IMPORTANCE OF GMP IN FOODSERVICE INDUSTRY

GMP certification scheme provides independent verification and certification.

Pre-requisites for the implementation of an effective HACCP food safety programme are being followed.

Customers and employees develop sustainable respect for an organization which demonstrates its proactive commitment to food safety.

Increases the customer satisfaction, employees, stockholders, regulators.

Avoid production of unsanitary and contaminated.

Good Business PracticesEnhance the image of the company in the safe food production.

Operating cost drops as rework and penalties due to non-compliance reduces and efficiencies increases.

GMP covers all safety and written procedures (SOP), which makes employees more efficient and reduces errors during the manufacturing process.

Increase your competitive edge in the international market. Facilitate the process of following the regulations of Malaysian Food Hygiene Regulations 2009 and Food Regulations 1985.
THE IMPORTANCE OF GHP IN FOODSERVICE INDUSTRY

To achieve the goal of ensuring that food is safe and suitable for human consumption.

GHP should reduce the likelihood of introducing hazards that may be difficult or impossible to control at later stages of the food chain • Examples: pesticides, antibiotics, mycotoxins, microorganisms in foods eaten raw or fresh.

Personal hygiene requires the cleaning of all parts of the body.

The hands and finger nails have to be cleaned because the germs cause contagious diseases such as diarrhea, worms and epidermophytosis.

The teeth and mouth have to be cleaned. mouth diseases such as cavities, gingivitis, and stomach disorders due to indigestion.

Improper sewage and garbage disposal can lead to the spreading of contagious diseases through rats, mosquitoes, flies, cockroaches and stray dogs.

Face hair, body, legs, ears and hands should be cleaned.

Practice of personal hygiene should be carried out as daily, weekly, and monthly activities.

THE IMPORTANCE OF SOP IN FOODSERVICE INDUSTRY

Foodservice Industry standard operating procedures (SOPs) are written practices and procedures of how your establishment will produce safe food. SOPs are a key component to your overall food safety program.

SOPs include specific details of how a policy will be implemented including:

Who will perform the task. What materials are needed. Where the task will be done. When the task will be performed. And how the person will do the task.

The importance of SOPs to your establishment, whatever the size, is that processes are standardized with step-by-step, how-to instructions that help anyone within your operation do the task in a consistent way. The SOPs provide step-by-step written procedure to help employees perform their job and keep them accountable because of documented expectations. If your goal is to consistently provide safe, high quality foods and services to your customers, SOPs will help you achieve this goal.



HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) SYSTEM

The safety programs of the past have reacted to problems and corrected hazardous condition after they happened. The HACCP system, on the other hand, is designed to participate and control problems before they happen. HACCP is the preferred approach to retail food safety because it provides the most effective and efficient way to ensure that food product are safe.



THE IMPORTANCE OF HACCP

1 the HACCP system enables food managers to identify the foods and processes that are most likely to cause food borne illnesses. When a potential problems is identified, the food establishment san initiate procedures to reduces or eliminate the risk of food borne illness and then monitor to make sure the procedures are being followed.

2 the HACCP system more accurately describes the overall condition of the establishment. Traditional assessments provide only an account of the establishment's. Traditional assessments provide only an account of the establishment's condition at the time of the the evaluation. Those violations present at the time of the audit noted, but they may not relate directly to food, time and temperature. The HACCP system enables food manager and regulatory agency personnel to track food-handling practices of the period of time.

SEVEN PRINCIPLES IN A HAZARD ANALYSIS CRITICAL CONTROL POINT SYSTEM



STEP 1: HAZARD ANALYSIS

The first principle in a HACCP system is analysis. This involves a hazard identifying *hazards* that might be introduced to food by certain food production practices or the intended use of the product. Hazard analysis starts with a thorough review of your menu of product list to identify all of the potentially hazardous food you serve . As you learned previously, Hazard of Food Safety, potentially hazardous food have properties that support rapid bacterial growth and can cause the food to become unsafe. Potentially hazardous food include:

Meats

- Dairy product.
- Poultry, eggs.
- Cooked foods such as beans ,pasta, rice ,potatoes.
- Cut cantaloupe and raw seed sprouts.

All of these foods are commonly found in food establishments.Hazard may be biological, chemical, or physical in nature. During the hazard analysis step, you should also estimate risk. Risk is the probability that a condition or conditions will lead to a hazard. Some of the factors that influence risk are the :

- Type of consumers served.
- Type of foods on the menu.
- Nature if organism.
- Past outbreaks.
- Size and type of food production operations.
- Extent of employee training.



- Food is not produced in a *sterile (microorganism free)* environment. Therefore, it can easily be contaminated by biological hazards such as bacteria, viruses, fungi, and parasites.
- During hazard analysis, look for steps in food production where foods may become contaminated, and microorganism may survive and multiply.
- Chemical hazards are toxic substances that may occur naturally or may be added during the processing of food. Examples of chemical contaminants include agricultural chemicals (i.e., pesticides, fertilizers, and food allergens.
- Harmful chemicals at very high levels have been associated with severe poisonings and allergic reactions.
- Chemicals and other non-food items should never be placed near food items.
- Physical contaminants in food can cause injury to the consumer. Glass, metal shaving, a food worker's personal property (jewelry, false fingernails, and hair pins), toothpicks, and pieces of worn equipment are examples of physical agents that may accidently either food during production and service.

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Hazard identification and risk estimation provide a logical basis for determining which hazards are significant and must be addressed in HACCP plan. The severity of a hazard is defined by the degree of seriousness of the consequences should it become a reality. Hazard the involve low risk and are not likely to occur need not be addressed in the HACCP plan.

Personal experience, facts generated by foodborne illness investigations, and information from scientific articles can be useful when estimating the approximate risk of hazard. When estimating risk, it is important to separate *safety* concerns from *quality* issues. For instance, as a quality issue, perishable foods *spoil concern* because foodborne disease investigations show that potentially hazardous foods left in the temperature danger zone too long can cause foodborne illness.

The last phase of the hazard analysis step involves establishing preventive measures. After the hazards have been identified, you must consider what preventive measures, if any, can be employed for each hazard. Preventive measures include:

- \succ Controlling the temperature of the food.
- ➤ Cross contamination control.
- ➤ Good personal hygiene practices.
- Other procedures that can prevent, minimize, or eliminate an identified health hazard (i.e limiting the amount of time a potentially hazardous food spends in the temperature danger zone).







BIOLOGICAL HAZARD



Microbiological hazard occurs when food becomes contaminated by microorganisms found in the air, food, water, soil, animals and the human body which may caused from raw material, processing steps during production of foods or even improper hygiene control.

Biological hazards includes harmful bacteria, viruses, fungi, yeasts, mould and viruses.

- → Salmonella
- → Staphylococcus
- → Campylobacter
- → Clostridium botulinum
- → Clostridium perfringens
- → Escherichia coli (E. coli)
- → Listeria
- → Shigella

PHYSICAL HAZARD



- = Any extraneous object or foreign matter in a food which may cause illness or injury to a person consuming the product.
- Sources for such contaminants include raw materials, badly maintained facilities and equipment, improper production procedures and poor employee practices.
- Eg:
- > Plastic
- > Glass
- Elastic bands
- > Wood chips
- > Staples
- > Pins
- > Paper > Bolt

> Hair

- > Band-aids
- > Jewelry
- Soil from the ground during harvesting



CHEMICAL HAZARD



•Pesticides may leave residues on fruits and vegetables. In general, these residues can be removed by scrubbing the surface and washing with water.

•These may already be present on certain foods in the form of pesticides or insecticides.

•Chemical hazards may also arise from incorrect storage and the misuse of chemicals used in food premises such as:

- → Cleaning agent / Detergent
- → Chemicals
- → Rodent baits & Pesticides
- → Chemical fertilizer
- → Heavy metal (Dioxin, Cadmium, Lead, Mercury, PAH & PCB)

ERGONOMIC HAZARD





•Ergonomic hazards refer to workplace conditions that pose the risk of injury to the worker's musculoskeletal system.

•Ergonomic hazards include repetitive movements, vibration, temperature extremes, and awkward postures that arise from improper work methods and improperly designed workstations, tools, and equipment.

•The worker – Physically condition / mental capability.

•The environment:

- → Noise
- → Temperature
- → Humidity
- \rightarrow Color
- → Methodology
- \rightarrow Tools / equipment

•The task – work that includes high force, repetition, frequencies and duration and inappropriate posture:

→ Improper lifting, lowering, pushing, pulling and twisting may cause strains and sprains.



STEP 2: IDENTIFY CRITICAL CONTROL POINTS (CCPs)

A critical control point is an operation (practice, preparation step or procedure) in the flow of food which will prevent, eliminate, of reduce hazards to acceptable levels. A critical control points provides a kill step that"s will destroy bacteria or a control step that prevents or slows down the rate of bacterial growth.

Some example of CCPs are:

- Cooking, reheating, and hot-holding.
- Chilling, chilled storage, and chilled display.
- Receiving, thawing, mixing ingredients, and other food-handling stages
- Product formulation(i.e reducing the pH of a food to below 4.6 or Aw to 8.5 or below).
- Purchasing seafood, MAP foods ,and ready-to-eat foods, where further processing would not prevent a hazard, from approved sources.

Identification of critical control points begins with of review of the recipe for the potentially hazardous ingredients and the development of a flow chart for the recipe. The flow chart will track the steps in the food flow from receiving to serving to serving.



Figure 5.1: Flow Chart for Meatloaf

STEP 3: ESTABLISH THE CRITICAL LIMITS (THRESHOLDS) WHICH MUST BE MET AT EACH CRITICAL CONTROL POINT



Set critical limits to make sure that each critical control point effectively blocks a biological, chemical, or physical hazard. Critical limits should be thought of as the upper and lower boundaries of food safety. When these boundaries are exceeded, a hazard may exist or cold develop.

The critical limit should be as specific as possible, such as ground beef or pork must be heated to an internal temperature of 155°F (68°C) or greater for at least 15 seconds. A well-defined critical limit makes it easier to determine when the limit has not been met.

Time

Temperature

Limit the amount of time food is in the temperature danger zone during preparation and service processes to **4 hour or less**. Keep potentially hazardous food at or **below 41°F(5°C) or reheating or above 135°F(57°C)** maintaining specific cooking,cooling,reheat ing and hot-holding temperature.

Water activity

Food with a water activity(Aw) of **85 or less** do not support growth of disease-causing bacteria. pH (acidity level)

Disease-causing bacteria do not grow in foods that have a **pH** of **4.6 or below**.

STEP 4: ESTABLISH PROCEDURES TO MONITOR CCPS

In each food establishment, someone should be responsible for monitoring critical control points. To monitor, make observations and measurements to determine whether a critical control point is under control. This will expose when a critical control point has exceeded its critical limits.

For example, monitoring tells you whether or not the internal temperature of poultry has reached 165 F (74 C) or above for 15 seconds. The risk of foodborne illness increase when a critical control point is not met. Monitoring is a critical part of a HACCP system and provides written documentation that can be used to verify that the HACCP system is working properly.

Monitoring can be performed either continuously or at predetermined intervals in the food production process. Continuous monitoring, such as that used to manage the temperature and timing of a cook-chill operation, is performed using temperature recording charts.

Food workers responsible for monitoring CCPs must know how to accurately monitor critical control points and records. They must also be given the tools (temperature-measuring devices, pH meter, etc) needed to take measurements and record their findings. If a product or process does not meet critical limits, immediate corrective action is required before a problem occurs.

Serious problem can occur when critical limits are not met. If you detect that a critical limit was exceeded during the production of a HACCP monitored food, correct the problem immediately. The flow of food should not continue until all CCPs have been met.

First, determine what went wrong. Next, chose and apply the appropriate corrective action. For example, if the temperature of the roasted chicken on your steam table is not 145°F (63°C) or higher, check the steam table to make sure it is working properly and will keep food hot. At the same time, put the chicken on the stove and reheat it the it rapidly to 165°F (74°C). The chicken should be discarded if you suspect it has been in the temperature danger zone for 4 hours of more.

Additional corrective action include having employees measure the temperature of the product at more frequent and stir the chicken to ensure the even distribution of heat throughout the product. Record the additional steps and verify that the critical limit is met using the effectiveness of your food safety system.

STEP 5: ESTABLISH THE CORRECTIVE ACTION TO BE TAKEN WHEN MONITORING SHOWS THAT A CRITICAL LIMIT HAS BEEN EXCEEDED

STEP 6: ESTABLISH PROCEDURES TO VERIFY THAT THE HACCP SYSTEM IS WORKING

The verification process typically consist of 2 phase.

i) verify that the critical limit you have established for your CCPs will prevent, eliminate or reduce hazards to acceptable levels.ii) verify that overall HACCP plan is functioning effectively.

<u>Guideline for determining how and when to implement haccp plant</u> <u>verification procedures</u>

Verification procedure may includes

- A review appropriate verification inspection schedules.
- A review of the CCP records.
- A record of departure from critical limit and how they were corrected.
- . Visual inspection of food production operation to determine if ccps are under control.
- A random sample collection and analysis.
- A review of the critical limits to verify if they are adequate to control hazards.
- A reviews of the written record of verification of inspections which certifies

compliance with the haccp plan or deviations from the plan and the corrective action taken.

• Validation of the haccp plan, including on site-review and verification of flow diagrams and critical control points.

A review of modification made to the haccp plan.

Verification inspection should conducted under the following conditions:

Routinely and unannounced to ensure the selected ccps are under control.

· If it is determined that intensive coverage of specific food is need because of new information of concerning food safety.

- When food prepared at the establishment have been to a foodborne illness.
- When established criteria have not been met.

• Rto verify that that change have implemented correctly after a haccp plan has been modify.

Verification report should contain the following information

 \cdot Existence of the haccp plan and person responsible for admistering and updating plan.

• The status of record associated with ccp monitoring.

• Direct monitoring data of the ccp while in operation certification that monitoring equipment is properly calibrated and in working order.

• Any sample analyzed to verify that cccp are under control(analyzed may involve physical,microbiobiological organoleptic methods).

- Modification of ccp plan.
- Training and knowledge of individuals responsible of monitoring ccps.

STEP 7: ESTABLISH AN EFFECTIVE RECORD KEEPING SYSTEM THAT DOCUMENTS THE HACCP SYSTEM

An effective HACCP system requires the development and maintenance of a written HACCP plan. The plan should provide as much information as possible about the hazards associated with each individual food item or group of food items covered by the system. Clearly identify each CCP and the critical limits that have been set for each CCP. The procedures for monitoring critical control points and record maintenance must also be contained in the establishment's HACCP plan.



Figure 5.2 Examples of Documents That Can Be Included in the Total HACCP System



The application of HACCP in foodservice industry

HACCP based procedures provide businesses with a cost effective system for control of food safety, from ingredients right through to production, storage and distribution to sale and service of the final consumer. The preventive approach of HACCP based procedures not only improves food safety management but also complements other quality management systems. The main benefits of HACCP based procedures are:

- Saves your business money in the long run.
- Avoids you poisoning your customers.
- Food safety standards increase.
- Ensures you are compliant with the law.
- Food quality standards increase.
- Organises your process to produce safe food.
- Organises your staff promoting teamwork and efficiency.
- Due diligence defence in court.

PUBLIC HEALTH LAW TOPIC 6

PURPOSE

To protect the consumer health.

To control the food quality and safety.

To protect the National image, hence it reflect the basic safe and hygienic Nation true identity.

To promote the health law and spread the awareness among public.

REQUIREMENT in maintaining the quality & safety of food.



AN OVERVIEW OF FOOD LEGISLATION

Malaysia has realized that food safety can no longer be considered solely as a domestic entity nor can it be the responsibility of a single agency. The Food Safety and Quality Division (FSQD) of the Ministry of Health (MOH) is in charge of the implementation and enforcement of the law. Another significant authority is the Ministry of Agriculture, local authorities and Customs (for import and export of food) and the Ministry of Science, Technology and Innovation (MOSTI), who is responsible for developing and promoting food standards.

The main legislation regulating food safety is the Food Act 1983 and Food Regulations 1985. It aims to protect the public against food related hazards and frauds, as well as to promote and motivate the preparation, handling, distribution, sale and consumption of safe, high quality food. Among the strategies for ensuring food safety are the following:

- Review and update legislation and strengthen infrastructure.
- Enhance collaboration among government agencies, consumer bodies, academia, industry and international organizations.
- Develop and train manpower resources.
- Educate consumers to raise their awareness of food safety issues. Enforcement involves inspection and sampling.

FOOD ACT 1983

An Act to protect the public against health hazards and fraud in the preparation, sale and use of food, and for matters incidental thereto or connected therewith.

BE IT ENACTED by the Seri Paduka Baginda Yang di-Pertuan Agong with the advice and consent of the Dewan Negara and Dewan Rakyat in Parliament assembled, and by the authority of the same, as follows:

1. (1) This Act may be cited as the Food Act 1983 and shall apply throughout Malaysia.

(2) This Act shall come into force on such date as the Minister may by notification in the Gazette appoint and the Minister may appoint different dates for the coming into force of this Act for different States in Malaysia or for different provisions of this Act.





Interpretation

Section 2 define several important terms	Food	includes every article manufactured, sold or represented for use as food or drink for human consumption or which enters into or is used in the composition, preparation, preservation, of any food or drink and includes confectionery, chewing substances and any ingredient of such food, drink, confectionery or chewing substances.
	Food premises	premises used for or in connection with the preparation, preservation, packaging, storage, conveyance, distribution or sale of any food, or the relabelling, reprocessing or reconditioning of any food.
	Label	includes any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, painted, embossed or impressed on, or attached to or included in, belonging to, or accompanying any food.
	Package	includes anything in which or any means by which food is wholly or partly cased, covered, enclosed, contained, placed or otherwise packed in any way whatsoever and includes any basket, pail, tray or receptacle of any kind whether opened or closed.
	Animal	includes any quadruped or bird either domesticated or otherwise, fish, reptile or insect, whole or part of which are used for human consumption.
	Appliance	includes the whole or any part of any utensil, machinery, instrument, apparatus, or article used for or in connection with the preparation, preservation, packaging, storage, conveyance, distribution or sale of food.
	Authorized officer	means any medical officer of health or any assistant environmental health officer of the Ministry of Health or of any local authority, or any suitably qualified person, appointed by the Minister to be an authorized officer under section 3.

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Administration and encorcement

Section concerned are from Sec 3 to Sec 12 FA1983

3. Appointment of analysts and authorized officers.

- 3A. Approved laboratories.
- 4. Powers of authorized officers.
- 5. Power to take sample.
- 6. Procedure for taking sample.
- 7. Certificate of analyst.
- 8. Power to call for information.

9. Power of the Director General to obtain particulars of certain food ingredients.

10. Director may order food premises or appliances to be put into hygienic and sanitary condition.

11. Closure of insanitary premises.

12. Conviction published in newspapers

SEC 3 FA 1983

Appointment of analysts and authorized officers

•3(1) - Minister may appoint such number of analysts as he may consider necessary and determine their qualifications, conduct and duties.

•3(2) - Minister may appoint such number of authorized officers

•3(3) – Minister can instruct public officer to procure for analysl samples of any food.



SEC 4 FA 1983

Powers of authorized officer

•4(1) - authorized officer may at any time can.

(a)enter any food premises and examine any food found and take samples of such food and examine anything that used for the preparation, preservation, packaging, storage, conveyance, distribution or sale of the food.

(b)stop, search or detain any aircraft, ship or vehicle in which he believes on reasonable grounds that any food being conveyed and examine any such food and take samples.

(c) open and examine any package which he believes contains any food.

(d) examine any books, documents or other records found in any food premises that contain any information relevant.

(e) demand the production of the National Registration Identity Card, the Business Registration Certificate or any other relevant document.

(f) seize and detain for such time as may be necessary any food or appliance.

(g) mark, seal or otherwise secure, weigh, count or measure any food or appliance, the preparation, preservation, packaging, storage, conveyance, distribution or sale.

SEC 5 FA 1983 Power to take sample

•5(2) - An authorized officer may at any place demand and select and take or obtain samples for the purpose of analysis without paymen from any manufacturer.

•5(5) - person who refuses or neglects is liable on conviction imprisonment for a term not exceeding one year or to fine or to both.

SEC 6 FA 1983

Procedure for taking sample

 $\cdot 6(1)$ - authorized officer shall inform the seller that he intends to have the sample analysed by an analyst.



POWERS OF DIRECTOR GENERAL

•Sec 9 - Power of the Director General to obtain particulars of certain food ingredients.

•Sec 10 - Director may order food premises or appliances to be put into hygienic and sanitary condition.

•Sec 11 - Closure of insanitary premises.

•Sec 12 - Conviction published in newspapers.

Offences and evidences

Sec 13(1) - Any person who prepares or sells any food that has any substance which is poisonous, harmful or otherwise injurious to commits health an offence and shall be liable, on conviction, to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding ten years or to both.

Sec 13A(1) – food that have diseased, filthy, decomposed or putrid animal or vegetable substance, any portion of an animal unfit for food, the product of an animal which has died otherwise than by slaughter or as game.

Shall be liable to a fine not exceeding fifty thousand ringgit or to imprisonment for a term not exceeding eight years or to both.

Sec 13(3) - person who prepares or sells any food that is enclosed in a sealed package and the package is damaged and can no longer ensure protection to its contents from contamination or deterioration, commits an offence and shall be liable to a fine not exceeding thirty thousand ringgit or to imprisonment for а term not exceeding five years or to both.

Food containing substances injurious to health

Food unfit for human consumption

Food unfit for human consumption (package)

Offences and evidences

	Sec 13B(1) - No person shall prepare or sell any adulterated food.	
	What is adulterated food?	
Adulterated food	 What is adulterated food? (a) contains or is mixed or diluted with any substance which diminishes in any manner its nutritive (b) any substance or ingredient has been extracted, wholly or in part, or omitted, from the food and by reason of such extraction or omission, the nutritive or other beneficial properties of the food are less than those of the food in its specified state, or the food operates or may operate to the prejudice or disadvantage of the purchaser or consumer; (c) it contains or is mixed or diluted with any substance of lower commercial value than such food in a pure, normal or specified state and in an undeteriorated and sound condition; (d) it contains any substance the addition of which is not permitted by this Act or any regulations made under this Act; (e) it does not comply with the standard or specification prescribed by any regulations made under this Act; (f) it contains a greater proportion of any substance than is permitted by this Act or any regulations made under this Act; (g) it is mixed, coloured, powdered, coated, stained, prepared or otherwise treated in a manner whereby damage or 	
	inferiority may be concealed; or (<i>h</i>) it is in a package, and the contents of the package as originally packed have been removed in whole or in part and other contents have been placed in the package.	
	(4) A person who contravenes any of the provisions of this section commits an offence and shall be liable, on conviction, to a fine not exceeding twenty thousand ringgit or to imprisonment for a term not exceeding five years or to both.	
Prohibition against sale of food not of the nature, substance or quality demanded	Sec 14(1) - person who sells any food which is not of the quality of the food demanded by the purchaser, commits an offence and is liable on conviction to imprisonment for a term not exceeding five years or to fine or to both.	

Offences and evidences

Sec 15 - any person prepares, who packages, labels or advertises any food which does not comply with that standard is liable on conviction to imprisonment for a term not exceeding three years or to fine or to both.

Labelling not complying with standard of food

Sec 16 - person who prepares, packages, labels or sells any food in a manner that is false is liable on conviction to imprisonment for a term not exceeding three years or to fine or to both.



False labelling, etc.







Artificial enhancement



Fraudulent labeling claims



Use of undeclared, unapproved, or banned biocides



Formulation of an fraudulent product



Removal of authentic constituents



Counterfeits, theft overruns gray markets



Importation, warranty and defences

Importation

Warranty

Sec 29. (1) Subject to subsections (2) and (3), the importation of any food which does not comply with the provisions of this Act or any regulation made thereunder is prohibited.

(2) Where food which is sought to be imported into Malaysia is processed food in a finished form and if sold in Malaysia constitutes an offence relating to labelling, the food may be imported into Malaysia for the purpose of relabelling it so that it complies with the provisions of this Act relating to labelling.

(3) Where food which is sought to be imported into Malaysia is raw or semi-processed food and if sold in Malaysia constitutes an offence, the food may be imported into Malaysia for the purpose of reprocessing or reconditioning it so that it complies with the provisions of this Act.

(4) Where such food is imported into Malaysia for the purposes of relabelling, reprocessing or reconditioning it and the food is not relabelled, reprocessed or reconditioned within three months of the importation, the food shall be exported by the importer within a period of two months or such other period as the Minister may determine and, where it is not so exported, it shall be forfeited and disposed of as the Minister may direct.

(5) The Director may require the importer to relabel, reprocessor recondition the food in a designated area under the supervision of an authorized officer to ensure that the relabelling, reprocessing or reconditioning of the food comply with the provisions of this Act.

(6) The Minister may exempt any food or class of food from the provisions of this section.

Sec 30. (1) No manufacturer or distributor of, or dealer in, any food specified by the Minister shall sell such food to any vendor unless a written warranty or other written statement is given that the food complies with the provisions of this Act or any regulation made thereunder.

(2) Any person who contravenes the provisions of subsection (1) commits an offence and is liable on conviction to imprisonment for a term not exceeding three years or to fine or to both.

Reliance on written warranty a good defence

Sec 31. (1) Subject to the provisions of this section it shall be a good defence in any prosecution for an offence under this Act or any regulation made thereunder if the defendant proves that—

(a) he purchased the food sold by him in reliance on a written warranty or other written statement as to the nature of the food purchased signed by or on behalf of the person from whom the defendant purchased the same;

(b) he had no reason to believe that the food sold did not conform to such written warranty or statement; and

(c) if the food had truly conformed to such written warranty or statement, the sale of the food by the defendant would not have constituted the offence charged against him.

Miscellaneous provisions

Power to order appearance in court

Sec 32B. (1) Where the Director or any authorized officer has reasonable grounds for believing that any person committed an offence under this Act, he may, in lieu of applying to the court for a summons, forthwith serve upon that person a notice ordering that person to appear before the nearest court of a Magistrate having jurisdiction to try the offence, at a time and date to be stated in such notice.

Consist 4 sections

Power to compound

Prosecution

Sec 32A. No prosecution shall be

instituted for an offence under this Act

or any regulation made under this Act

without the consent in writing of the

Public Prosecutor.

Sec 33. (1) The Director or any authorized officer authorized by the Director may, with the consent in writing of the Public Prosecutor, compound any compoundable offence committed by any person by making a written offer to the person and by collecting from the person an amount of money not exceeding fifty per centum of the amount of maximum fine for the offence committed.

Offence by body corporate

Sec 33A. Where a body corporate commits an offence under this Act or any regulations made under this Act, any person who, at the time of the commission of the offence, was a director, manager, secretary or other similar officer of the body corporate or was purporting to act in any such capacity, or was in any manner or to any extent responsible for the management of any of the affairs of the body corporate. Importances of food act 1983



FOOD REGULATION 1985

The Food Regulations 1985 is the key supporting regulation for food safety covering procedures for taking samples, labelling, food additives and nutrient supplement, food packaging, and incidental constituent, additionally, food standards and particular labelling requirements for more than 380 food items.



Part I: Warranty



Reg 3.

Food which requires a written warranty from manufacturer, etc. The food in respect of which the manufacturer, distributor or dealer is required to give a written warranty or other written statement under section 30 of the Act, when selling such food to any vendor, shall be as specified in the First Schedule.

Part II: Procedures for taking samples

Under Reg 4(1) of FR 1983

The aims of this section are:

- taking food for chemical, physical & microbiology analyze in order to ensure foods are accordance to FA 1983 & FR 1983;
- to standardize the process of sampling food as per FA 1983 & FR 1983.

<u>Reg 4 (1) Procedure on taking samples</u> <u>for physical and chemical analysis</u>

(1) Where an authorized officer has taken or otherwise procured a sample of food for the purpose of physical or chemical analysis, he shall-

(a) divide the sample into three separate parts and mark and seal or fasten up each part;

(b) offer one part to the seller, importer or manufacturer or his agent or the person having charge of the food;

(c) deliver either personally or through another authorized officer or by registered mail one of the remaining parts to an analyst; and (d) retain the other remaining part.

<u>Reg 5 Procedure on taking sample for</u> <u>microbiological analysis.</u>

Canned food for infants and children

Full cream milk powder

Tea, tea

dust, tea extract and

scented tea

Infants

formula

Skimmed

milk powder

Cereal

based food

for infants

and children

Flavoring

substance

Coloring

substance

Where a sample of food is required for microbiological analysis, the authorized officer taking shall—

(a) only take one sample and shall not divide such sample into separate parts;

(b) mark and seal the sample and

(c) deliver such sample personally or through another authorized officer to an analyst.

Part III: Labeling



- a date permanently marked or embossed on the package, or in the label on the package, of any food signifying the expiry date or the date of minimum durability of that food, as the case may be.



Expiry date - the date after which the food, when kept in accordance with any storage conditions set out in the label of such food, may not retain the quality attributes normally expected by a consumer; and

Reg 14



Date of minimum durability - the date until which the food, when kept in accordance with any storage conditions set out in the label of such food, will retain any specific qualities for which tacit or express claim has been made

Reg 12

(1) The particulars that are required by regulation 11, or by any other regulation, to appear on the label, shall appear conspicuously and prominently in the label.

(2) Except as otherwise provided in these Regulations, the lettering for the particulars that are required by paragraph (a) of subregulation (1) of regulation (11) to appear on the label shall be so prominent in height, visual emphasis, and position as to be conspicuous by comparison with any other matter appearing on the label.



Reg 11 (1) (a) & (b)

A label must contain :

• The description of the food /appropriate designation.

• The word "mixed" or 'blended' in case of mixed or blended foods.

Reg 11(1)(c)

The statement "CONTAINS BEEF, PORK OR LARD" where the food contains beef, pork or lard.

Reg 11(1)(d)

The words "CONTAINS ALCOHOL" where the food contains added alcohol.

Reg 11 (1) (e)

List of Ingredient if the food consists of two or more ingredients (excluding water, food additive or added nutrients) • Name of ingredients in descending order of proportion (water can be excluded).

Prohibited Claims

Reg 18 The words "pure" or any other words of the same significance unless the food is of the strength, purity, or quality prescribed by the regulation.

The word "medicated", "tonic", "health' or any other words of the same significance.

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Part IV: Food additive & nutrient supplement

Reg 19 Food additive means any safe substance that is intentionally introduced into or on a food in small quantities in order to affect the food's keeping quality, texture, appearance, odour, taste, and that results or may be reasonably expected to result directly or indirectly in the substance or any of its by-products becoming a component of, or otherwise affecting the characteristic of, the food, and includes any preservative, colouring substance, flavouring substance, flavour enhancer, antioxidant and food conditioner, but shall not include nutrient supplement, incidental constituent or salt.



<u>Coloring substance</u> any substance that, when added to food, is capable of imparting color to that food and includes coloring preparation.



Flavoring substance

any substance that when added to food, is capable of imparting flavor to that food and includes the spices.

<u>Flavor enhancer</u>

any substance that, when added to food, is capable of enhancing or improving the flavor of that food.



THE DANGER LIST

Additive	Where used	Potenti
E102 - tartrazine	Sweets, biscuits, mushy peas	Hypera asthma
E124 - ponceau 4R	Sweets, biscuits, drinks	Allergy,
E110 - sunset yellow	Sweets, ice cream, drinks	Gastric
E122 - camoisine	Biscuits, jelly, sweets, ready meals	Allergy,
E104 - quinoline yellow	Sweets, smoked haddock, pickles	Hypera asthma
E129 - allura red	Soft drinks, cocktail sausages	Some en
E211 - sodium benzoate	Soft drinks, baked goods, Iollies	Hypera asthma

Potential problems Hyperactivity, asthma, rashes Allergy, intolerance Gastric upset, allergy Allergy, intolerance Hyperactivity, asthma, rashes. Some evidence of hypersensitivity Hyperactivity;

Part VI: Packages for food

Reg 27. Use of harmful packages prohibited Except as otherwise provided in these Regulations, no person shall import, manufacture, advertise for sale or sell, or use or cause or permit to be used in the preparation, packaging, storage, delivery or exposure of food for sale, any package, appliance, container or vessel which yields or could yield to its contents, any toxic, injurious or tainting substance, or which contributes to the deterioration of the food.

Reg 28. Safety of packages for food No person shall import, manufacture, advertise for sale or sell any package, appliance, container or vessel made of enamel or glazed earthenware that is intended for use in the preparation, packaging, storage, delivery or exposure of food for sale and is either capable of imparting lead, antimony, arsenic, cadmium or any other toxic substance to any food prepared, packed, stored, delivered or exposed in it, or is not resistant to acid unless the package, appliance, container or vessel satisfies the test described in the Thirteenth Schedule.

Reg 29. Use of polyvinyl chloride package containing excess vinyl chloride monomer prohibited No person shall import, manufacture or advertise for sale or sell or use in the preparation, packaging, storage, delivery or exposure of food for sale, any rigid or semi-rigid package, appliance, container or vessel, made of polyvinyl chloride which contains more than 1 mg/kg of vinyl chloride monomer.

Reg 30. Food packaged in polyvinyl chloride container shall not contain excess vinyl chloride monomer No person shall import, prepare or advertise for sale or sell any food in any rigid or semi-rigid package, appliance, container or vessel made of polyvinyl chloride if the food contains more than 0.05 mg/kg of vinyl chloride monomer.


Part VII: Incidental constituent

Reg 37 (1) In these Regulations, "incidental constituent" means any foreign, extraneous, toxic, noxious or harmful substances that is contained or present in or on any food and includes metal contaminant, microorganisms and their toxins, drug residue and pesticide residue but does not include preservative, colouring substance, flavouring substance, flavour enhancer, antioxidant, food conditioner, non-nutritive sweetening substance or nutrient supplement or any other substance permitted to be added to food by these Regulations.

(2) No person shall keep, carry, spread or use, or cause or permit to be kept, carried, spread or used, any toxic, noxious or harmful substance so as to expose a food intended for sale to the risk of contamination by that substance at any time in the course of the preparation, manufacture, storage, packaging, carriage, delivery, or exposure for sale, of the food.

(3) No person shall import, prepare or advertise for sale or sell any food containing any incidental constituent, except as otherwise specified in regulations 38, 39, 40 and 41.

Part IX: Use of water, ice of steam

Reg 394. Standard for wholesome water, ice or steam.

(1) Water shall be clean and free from contamination, objectionable taste and odour, and shall comply with the standard as prescribed in the Twenty-fifth Schedule.

(2) In these Regulations any reference to "potable water" shall be taken to be a reference to "water" as prescribed in subregulation (1).

(3) Ice and steam shall be the product derived from water that complies with the standard prescribed in subregulation (1).

(4) No person shall use, cause or permit to be used, any water, ice or steam in the preparation or manufacture of any food for sale, unless that water, ice or steam complies with the standard prescribed in this regulation.

(5) No person shall cause or permit any water, ice or steam to come into contact with a food for sale, in the course of its preparation, storage, delivery or exposure for sale, unless that water, ice or steam complies with the standard prescribed in this regulation.

Part X: Miscellaneous

Reg 395. Food not elsewhere standardized.		
 (1) Food not elsewhere standardized shall be food for which a standard has not been otherwise expressly prescribed by these Regulations. (2) Food not elsewhere standardized may contain permitted nutrient supplement, permitted food conditioner, permitted flavouring substance, permitted colouring substance and permitted flavouring enhancer. (3) Food not elsewhere standardized shall not contain permitted non-nutritive sweetening substance. (4) There shall not be written in the label on a package containing food not elsewhere standardized or in an advertisement relating to that food any word or expression that compares a nutritional property or the ingredients of a food not elsewhere standardized with those of another food. (5) Food not elsewhere standardized shall not be described or presented in such manner or by such name or pictorial or other representation or device as is suggestive of another article of food of which it is intended to be an imitation or substitute or which it resembles. (6) The word "food not elsewhere standardized" shall not appear on the label of any package containing food not elsewhere standardized. 		
Reg 396. Food irradiation.		
 (1) For the purposes of these Regulations, "ionizing radiation" means all radiations capable of producing ions directly or indirectly in their passage through matter. (2) No person shall import, prepare or advertise for sale or sell any food (a) that has been intentionally exposed to ionizing radiation without the approval of the Director-General to such radiation first having been obtained; or (b) that has been accidentally exposed to ionizing radiation. (c) Notwithstanding paragraph (a) of subregulation (2), no food shall be treated with ionizing radiation if such treatment is expressly prohibited by these Regulations. 		
Reg 397. Penalty.		
 (1) Any person who contravenes or fails to comply with any provisions of these Regulations commits an offence. (2) Any person who commits an offence against these Regulations for which no penalty is provided by the Act shall, on conviction, be liable to a fine not exceeding five thousand ringgit or imprisonment for a term not exceeding two years. 		



COLLECTION ASSESSMENTS





Identify TRUE/FALSE the below statement (10m).

No.	Statement	TRUE / FALSE
1	<i>Clostridium botulinum</i> can be found in intestines tract and skin of poultry.	
2	The preferred way to thaw foods is in a container of cool water.	
3	The first priority of a HACCP system should be identify the potentially hazardous foods on the menu.	
4	The food flow begins with checking products for defects when they are delivered.	
5	Chemical may be stored above packaged foods.	
6	When a customer suspects he or she contracted a foodborne illness at a food establishment, the manager should acknowledge and do everything possible to find the cause of the problem.	
7	Dry storage is suitable for food in packaged such as cans, bottles, jars and bags.	
8	Reject any frozen packages that are not tightly sealed.	
9	Dented can is a minor defect that is acceptable during receiving.	
10	Fresh meat shall be keep at the top level of refrigerator during thawing process.	



PLEASE FILL IN THE BLANKS WITH THE RIGHT ANSWER (15m).

1.	is the transfer bacteria from a source to a high risk food.		
2.	The amount of available water for bacteria growth is called		
3.	Do not expose food to the for more than		
	hours.		
4.	Food is the presence in food of harmful chemical and		
	microorganism which can cause consumer illness.		
5.	refer to the stage where microbial actively growth and multiply.		
6.	are organisms that live within or feed of another organism.		
7.	Toxic metals such as copper, brass, cadmium, lead and zinc can be a source of		
	contamination.		
8.	The temperature between 4°C to 65°C is known as		
9.	Bacteria that are helpful and used in cultured drink known as		
10.	is the level of acidity and alkalinity that suitable for bacteria growth.		
11.	is known as hygienic practices that important at the whole proceed of		
	food production and responsible to protect the safety of food.		
12.	is needed by food industry for the purpose of identification of hazard.		
13.	function to ensure the management system is in place and able to reduce		

- food waste.
- Bacteria show a decreasing number in log may due to the accumulation of his waste is known as _____.
- 15. ______ is refers as protecting over the equipment or utensil used in food production.





- 1. Identify which below indicates a critical control point (CCP).
 - A. An operation in the flow of food that will prevent, eliminate, or reduce hazards to acceptable levels
 - B. The probability that a conditions will lead to a hazard
 - C. An estimate of the number of potentially hazardous foods served by a food establishment
 - D. An estimate of the number of steps that will be required to successfully implement the HACCP system
- 2. Foods contaminated with disease-causing microorganisms will display which of the following characteristics?
 - A. A white mold on the surface of the food
 - B. A salty or sour taste or an alcohol smell
 - C. A and B are both true
 - D. None of the above answers
- 3. After proper cooking, all foods that are to be held cold must be:
 - A. Cooled quickly and held 135°F (57°C) or below
 - B. Cooled slowly and held at 50° F (10° C) or below
 - C. Cooled quickly and held at $41^{\circ}F(5^{\circ}C)$ or below
 - D. Stored at room temperature until serving
- 4. Which of the following storage practices should prompt immediate corrective action?
 - A. Products in the dry storage area are being rotated on a first-in, first-out stock basis
 - B. Foods stored in the dry storage area are stored 6" off the floor on slatted shelves
 - C. Raw whole chicken are stored above macaroni salad in the reach-in refrigerator
 - D. Toxic chemicals are being stored in a separate storage away from food
- 5. All potentially hazardous foods should be reheated to _____ °C within _____.
 - A. $60^{\circ}C/4$ hours
 - B. $63^{\circ}C/4$ hours
 - C. $68^{\circ}C/2$ hours
 - D. 74°C/2 hours



Continue..

- 6. Choose the **CORRECT** approach involved in HACCP system.
 - A. elimination of additives and other toxins entering the atmosphere when food is manufactured
 - B. elimination of foodborne illness transmission during cooking and cleaning
 - C. prevention of foodborne illness during the production and preparation of food
 - D. prevention of foodborne illness during a particular time period in food processing
- 7. Foods that have been frozen may be thawed in any of the following ways **EXCEPT**:
 - A. As part of the cooking process
 - B. In a microwave oven followed by immediate cooking
 - C. In a refrigerator, on the bottom shelf to avoid contaminating other food
 - D. None of above answers
- 8. Which of the following food should not be rejected upon delivery?
 - A. Fresh fish that has dull, sunken eyes and soft flesh
 - B. Poultry with darkened wing tips and soft flesh
 - C. Canned fruit with small amounts of surface rust on the lid of the can
 - D. Fresh beef products that are delivered at 7°C
- 9. Identify which statement is that **NOT** related to Critical Control Point.
 - A. A critical limit is the threshold that must be met to insure that each critical control point effectively controls a microbiological, chemical, or physical hazard
 - B. There must be at least two critical control points in the flow of food in order for a HACCP system to be implemented
 - C. A critical control points provide a kill steps that will destroy bacteria.
 - D. A critical control point is a point, step, or procedure in food preparation where controls can be applied and a food safety hazard can be prevented, eliminated, or reduced to acceptable levels.
- 10. Choose the CORRECT temperature for store raw food which is able to protect the food from any microbial hazard.
 - A. 5°C
 - B. 15°C
 - C. 21 °C
 - D. -18°C



STRUCTURE: PLEASE ANSWER ALL QUESTIONS (60m).

- 1. Identify the **THREE (3)** categories of foodborne hazards and give an example of each. (9 Marks)
- 2. Discuss **FIVE (5)** impacts of poor hygiene practises to the foodservice industry. (10 Marks)
- Explain THREE (3) function of microorganism in food industry. (6 Marks)
- All bacteria exist in a vegetative state. Vegetative cells grow, reproduce and produce waste just like other living organisms. Bacterial growth follows a regular pattern that consists of FOUR (4) phases; explain all the 4 phases and illustrate the phase of the growth curve. (10 Marks)
- Explain THREE (3) differences between Sanitizing and Cleaning. (6 Marks)
- 6. List **SEVEN (7)** individual sanitation practices that should be practiced by every food handler. (7 Marks)
- 7. Describe **SIX (6)** growth requirement factor that needed by a bacteria. (12 Marks)

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