



ESTHER'S AID SCHOOL

SECTOR: HOSPITALITY& TOURISM

TRADE: CULINARY ARTS

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MODULE CODE& NAME: CUA FH 301: HYGIENE AND FOOD SAFETY

LEARNING UNIT 1: MAINTAIN WORKPLACE HYGIENE

1.1 Importance of hygiene and sanitation at workplace

Q: What is hygiene and why is it important?

Simply hygiene are conditions or practices conducive to maintaining health and preventing disease, especially through cleanliness.

Good personal hygiene is important for both health and social reasons. It entails keeping your hands, head and body clean so as to stop the spread of germs and illness. Your personal hygiene benefits your own health and impacts the lives of those around you, too.

Importance of personal hygiene:

One personal benefit of good hygiene is having better health. Keeping your body clean helps prevent illness and infection from bacteria or viruses. Like in our example, the simple act of washing your hands regularly is an effective way to keep germs from spreading.

What is personal hygiene?

- **Personal hygiene** is how you care for your body. This practice includes bathing, washing your hands, brushing your teeth, and more. Every day, you come into contact with millions of outside germs and viruses. They can linger on your body, and in some cases, they may make you sick.
- One personal benefit of good hygiene is having better health. Keeping your body **clean** helps prevent illness and infection from bacteria or viruses. Like in our example, the simple act of washing your hands regularly is an effective way to keep germs from spreading

What are the basics of body hygiene?

- Having good hygiene is important for your physical health and well-being as well as your self-esteem and confidence. Whether it's taking good care of your oral health, doing simple things like washing your hands, or making sure your body is **clean**, good hygiene can help prevent illnesses and keep you healthy.

What are examples of personal hygiene?

The some of the great examples of personal hygiene are as follows:

1. Taking bath daily.
2. Cleaning teeth twice a day.
3. Changing into cloths.
4. Washing hair with shampoo at least twice a week.
5. Hanging clothes in sun to day nicely.
6. Washing hand after going to toilet.
7. Cutting finger nails. Etc.....

1.2 APPLY HYGIENE PROCEDURE:

Safe and hygienic handling of food and beverages

All foods, if handled properly, can be safe. Most instances of food poisoning do not have to happen at all, and can be avoided by following simple guidelines.

Handling food properly and safely is essential to preventing food borne illness. This page sets out to offer you the highest quality information on how to handle food safely, making it safe to eat, and stopping it from spoiling.

What you read here is applicable to a wide range of work and home environments. You will learn how to prepare, cook, serve and clean-up food in a proper manner. You will learn about:

- Preparing food in a safe manner.
- Serving food in a safe manner

- Stopping the spread of bacteria through cross contamination
- Routines to follow and habits to avoid.
- Presenting food in a hygienic and appetizing way.

The importance of following proper safe food handling procedures

From the time the food is delivered to the minute it is served to the customer, food safety should be at the top of the list. Food business operators in particular should bear in mind that they are required by law, to ensure that any of their staff who handle food receive appropriate training in hygiene matters that are in line with their work activity.

- Protects people from getting sick.
- Protects your businesses reputation with customers.
- Protects your job.

The handling of food can take place during;

- Cooking
- Cooling
- Hot holding
- Preparation
- Purchase
- Re-heating
- Serving
- Storage

General safe food handling tips:

- Do not wipe your hands on your clothing as this can easily transfer microbes and bacteria.
- Use paper towels to clean up during food preparation and serving.

- Change gloves, utensils and dishes when changing functions. For instance, use one pair of gloves for handling raw meat, and another pair handling fresh vegetables.
- Never run in food production or service areas
- Try to have just one person serve food that is about to be eaten.
- Prepare precooked frozen foods exactly as the directions/instructions on the packaging state.
- Have foods ready not any longer than necessary before serving time.
- Prepare and cook only as much food as you intend to use.
- Wash and sanitize flatware or other utensils, which fall to the floor.
- Do not taste foods with any utensil used either to mix or stir food.
- Pick up and hold all tableware by the handles.
- Store tableware/cutlery away from dust.
- Be careful when lifting lids/covers from hot food.
- Turn handles of saucepans away from the front of the stove when cooking.

Picking up ready to eat food

Whenever possible always try to handle any food items that are about to be eaten, with a utensil (i.e. tongs) rather than your bare hands.

Hand washing

Clean hands are essential for working in a kitchen environment. It's very easy for bacteria to spread from the food we touch to door handles, plates, cutlery and so on. Hand washing is one of the best ways to prevent the spread of germs between people.

When washing your hands try to;

- Use a soap dispenser rather than a bar of soap.
- Wash in a sink that has hot and cold running water.

- Wash in a sink that is separate from one that is used to wash foodstuff and utensils.
- Dry your hands with paper towels.

Wash your hands after:

- Starting work
- Using the toilet
- Handling raw and cooked foods
- Taking breaks
- Eating
- Drinking
- Smoking
- Coughing, sneezing or blowing their nose
- Touching your hair
- Playing with pets or handling animals
- Handling refuse or waste materials
- Handling cleaning chemicals

Procedure to washing your hands properly

Step 1. Wet your hands

Step2. Apply soap

Step 3. Lather/ scrub your hands, between fingers and under nails atleast for 20 seconds

Step 4. Rinse your hands thoroughly

Step 5. Dry with paper towels or a hot air dryer (remember that wet hands can carry and transfer more germs than dry ones) and Turn off the taps by using a paper towel to do so.

Hand basins and sinks

The sink you wash your hands in should be separate from ones where you prepare food or washing dishes. It should be in an accessible place, as this encourage people to use it and make it more likely to be used.

Gloves

Gloves are ideal for helping you to minimize bare hand contact with any cooked and ready-to-eat foods. They are there to protect both the food and the worker (i.e. they can be used to cover damaged skin or protect hands from risk of developing skin conditions).

Gloves must not be regarded as a “second skin”. They can become contaminated with bacteria in exactly the same way that hands can. They are not a substitute for good personal hygiene and hand washing.

- Replace gloves after each task.
- Wash and dry hands thoroughly before putting on any gloves
- Always use single use fresh gloves.
- Throw away plastic gloves after one use.
- The improper use of gloves can increase rather than reduce food hygiene risks, for instance a punctured/ penetrated glove can lead to glove material ending up in food.
- Gloves must only be used for one particular task.

Change gloves:

- At least once every hour.
- If they become contaminated.
- If they tear.
- When switching between handling raw and ready-to-eat foods.
- When changing tasks.
- After mopping, taking rubbish out, sweeping and cleaning.

Handling dishes, crockery and cutlery

- Try not to touch any part of a dish or plate which will come into contact with a person's food or mouth.
- Pick up cups and mugs by their handles, your fingers should be outside cups.
- Place teaspoons so they protrude from a dish.
- Pull out disposable cups from the base of a tube, this prevents your fingers from going inside the cup.
- Do not use plates which have become cracked or chipped.

Clothes

Try to avoid wearing outdoor clothes in a food preparation area, instead wear clean, and where appropriate, washable protective clothing.

Wear:

- A clean apron
- Gloves
- Hairnet

- Closed-in shoes to protect your feet, in case of hot spills or breakages.
- Shoes with slip-resistant soles, to stop you from slipping on hot spillages, etc.

Do not:

- Use your apron to wipe your hands on.
- Cook in loose fitting clothes.
- Work in the kitchen in soiled clothing.

Personal hygiene

Food service workers must maintain a high degree of personal cleanliness when receiving, storing, cooking, processing, packaging, transporting or disposing of food.

Here are some basic tips to follow;

- Keep fingers away from your face, mouth, hair, skin and other parts of the body.
- Don't brush or comb your hair when you are near food.
- Wash your hands frequently.
- Never smoke in food areas.
- Do not handle food with bare hands - use gloves instead.
- Do not eat or chew gum in food handling areas.
- Don't cough, sneeze, spit or smoke near food and avoid touching your nose, teeth, ears and hair, or scratching when handling food.
- Do not use fingers to sample food. Always use a clean spoon.

Washing knives

To prevent rusting and cross contamination, always wash and dry your knife immediately after you have finished using it. Do not let knives soak, especially if they have wood handles as the wood can expand when soaked in water.

Storing your knives

Store them in a special knife rack or wooden block. This way you can help keep the blades sharp by keeping the edges away from hard objects that can dull the blades.

Pot handles

Turn pot handles away from the front of the stove. This stops children from grabbing them, and adults from accidentally bumping into them.

Perishable foods

After, a delivery always unload perishable foods first and immediately refrigerate them.

Using kitchen appliances

- Make sure that all necessary guards are in place before operating any equipment.
- Do not distract a colleague who is operating dangerous kitchen appliances like mincers or mixers etc.
- Do not to operate any machinery or use any chemical until it has been assessed by a qualified person.
- Make sure you are properly trained to use any kitchen appliances.
- Wash and put away appliances that are not being used, do not leave them lying around.
- Return equipment to its correct storage place or location.
- Turn off all equipment and appliances at the end of each shift.

Children and non-food workers

Do not allow children, and people not involved in any cooking to roam/travel around a food preparation area.

Work surfaces

Make sure that work surfaces and equipment are visually clean, this goes a long way towards ensuring that they are free from high levels of harmful bacteria.

Clean as you go

Train yourself to 'clean as you go', for instance cleaning up any spillages immediately.

Cans

Before opening a can of food always clean the top of it first. Remember that once the can is opened, any food which is not used immediately must be quickly stored in food grade containers and placed in a refrigerator.

Can openers

Food can be left on any can opener after it has been used, it's therefore advisable to clean it after each use.

Plates

Never place cooked food on unwashed plate that had previously held raw meat, poultry, or seafood.

Food labels

Take the time to read product labels very carefully, and look for advisory statements like 'may contain ingredient X'.

Ovens

Close oven doors straight after removing or adding food items.

Meat and poultry

Keep meat and poultry in its packaging until just before using.

Towels and sponges

- Replace and wash dish towels and sponges often to prevent the spread of harmful bacteria throughout the kitchen.
- Do not use damp cloths when lifting hot items of equipment.

Uncovered food

Try not to leave food unattended or uncovered for long periods.

Cutting boards

Use separate cutting boards, dishes, utensils and cooking equipment for vegetables, raw meat and cooked meats.

Plates

When handling plates and trays do not touch eating surfaces with fingers.

Storing food in the fridge

Store raw meat, poultry and seafood by tightly wrapping it and then placing it on the bottom shelf of a refrigerator. This basically prevents the raw juices from dripping on other food.

- Refrigerate or freeze perishables, prepared food and leftovers within 2 hours.

Jewellery

Do not wear any watches, rings, bracelets or other jewellery when working with food. Germs can hide under them or just as worse they could accidentally fall off into the food.

CULINARY OR KITCHEN DRESS CODE/ PROFESSIONAL ATTIRE



Hair should be neat and cleanly trimmed. If the hair is not short, then it needs to be in a ponytail restrained above the collar by a hairnet or pins, not just tucked into a chef's hat/cap or coat.

Hair should be restrained in a professional manner with black or white barrettes, or scrunchies. Most schools also require appropriate natural hair color like neutral shades of black, brown, and blonde. Bangs must be kept to the top of the eyebrow.

Fingernails

Fingernails need to be short, neat, and clean, which includes being free of any polish. They must be regularly trimmed in order to prevent sort of cross contamination.

Jewelry

No facial jewelry, such as in eyebrows, eyelids, lips, tongue, upper ear or nose is permitted with the culinary dress code and it cannot just be covered with a bandage. The only jewelry that is acceptable is one plain ring and one watch. The culinary school may issue pins, which can be worn on the front of the uniform as they state.

Conclusion

These are the basics of the Culinary Dress and Grooming Codes that are required not only in schools but also in many professional kitchens.

Cross-contamination

The process by which bacteria or other microorganisms are unintentionally transferred from one substance or object to another, with harmful effect.

What are three ways to prevent cross contamination?

Wash hands and surfaces often. Harmful bacteria can spread throughout the kitchen and get onto cutting boards, utensils, and counter tops. To prevent this: Wash hands with soap and hot **water** before and after handling food, and after using the bathroom, changing diapers; or handling pets.

What causes the most cross contamination?

The **most** common example is the transfer of bacteria between raw and cooked food. ... For example, when you're preparing raw chicken, bacteria can spread to your chopping board, knife and hands and could **cause** food poisoning.

Why is it important to not cross contaminate?

Keep foods apart. Don't **Cross-Contaminate**. **Cross-contamination** is the transfer of harmful bacteria to food from other foods, cutting boards, utensils, etc., if they are **not** handled properly.

When handling foods, it is **important** to Be Smart, Keep Foods Apart — Don't **Cross-Contaminate**

- **Follow these five tips to prevent spread of pathogens through basic, good hygiene practices.**

Pathogens can be spread from food or unwashed hands to prep areas, equipment, utensils or other food. Fortunately, there are steps you can take to prevent this.

Here are five important tips for preventing cross-contamination in your operation.

1. **Implement a personal hygiene program.** To lessen the possibility of food handlers contaminating food, institute a good personal hygiene program that includes policies addressing critical hand practices like proper handwashing, hand care and glove use. Also address staff cleanliness and work attire, focusing on topics such as bathing, clean clothing, the proper use of hair restraints and prohibited jewelry. Finally, policies should be put in place to make sure food handlers come to work healthy. Include actions such as reporting illnesses and covering wounds.
2. **Remind employees to wash their hands.** This is especially important after using the restroom and after handling raw meat, seafood and poultry. Once employees have washed their hands, ensure they use a single-use paper towel or hand dryer, rather than any part of their uniform, to dry.
3. **Use separate equipment.** Each type of food should be prepped and handled with a separate piece of equipment. For example, use one set of cutting boards, utensils and containers for raw poultry. Use another set for raw meat, and use a

third set for produce. Some operations use colored cutting boards and utensil handles to help keep equipment separate. If this system is not possible at your restaurant, prep food at different times.

- 4. Clean and sanitize all work surfaces.** All work surfaces, equipment and utensils should be cleaned and sanitized after each task. Simply rinsing equipment is not enough to eliminate pathogens that can contaminate food.
- 5. Purchase prepared food.** You can prevent cross-contamination by purchasing food that doesn't require much prepping. This minimizes handling and can reduce the transfer of pathogens from one surface or food to another.

What is the proper way to dispose of garbage?

How to Dispose of Garbage Properly

1. Sort your garbage into a few different bins. ...
2. Bring any garbage that can be reused, such as toys or clothing, to a secondhand store to be resold.
3. Take recyclables such as glass, plastics and paper to a local recycling center. ...
4. Turn food and garden waste into compost.

Cleaning & Sanitizing procedures

General procedures for manual cleaning and sanitizing are as follows:

What are the steps in a cleaning procedure?

- Step 1 – Preparation. Remove loose dirt and food particles. ...
- Step 2 – Cleaning. Wash with hot water (60 °C) and detergent. ...
- Step 3 – Sanitizing (bacteria killing stage) ...
- Step 4 – Air drying.

Personal hygiene

What is personal hygiene?

- **Personal hygiene** is how you care for your body. This practice includes bathing, washing your hands, brushing your teeth, and more. Every day, you come into contact with millions of outside germs and viruses. They can linger on your body, and in some cases, they may make you sick.
- One personal benefit of good hygiene is having better health. Keeping your body **clean** helps prevent illness and infection from bacteria or viruses. Like in our example, the simple act of washing your hands regularly is an effective way to keep germs from spreading

What are the basics of body hygiene?

- Having good hygiene is important for your physical health and well-being as well as your self-esteem and confidence. Whether it's taking good care of your oral health, doing simple things like washing your hands, or making sure your body is **clean**, good hygiene can help prevent illnesses and keep you healthy.

What are the types of personal hygiene?

- 1 Hair hygiene; 2 Face hygiene; 3 Body hygiene; 4 Hand hygiene; 5 **Feet** hygiene; 6 Nail hygiene; 7 Armpit hygiene; 8 Oral hygiene; 9 Eye hygiene.

Why do I have bad hygiene?

It can also cause serious health problems, spreading germs that cause illness and diseases that can range from the common cold to athlete's foot. Poor oral hygiene can lead to bad breath and cavities, not to mention compromised dental health. Poor hygiene can be caused by a number of factors.

Diseases in Indigenous communities caused by germs and parasites resulting from inadequate domestic and personal hygiene

- food poisoning.
- gastroenteritis.
- diarrhea caused by *Campylobacter*.
- pneumonia.
- trachoma.
- skin infections.

How can we maintain personal hygiene and cleanliness?

If you want to minimize your risk of infection and also enhance your overall health, follow these basic personal hygiene habits:

1. Bathe regularly. Wash your body and your hair often. ...
2. Trim your nails. ...
3. Brush and floss. ...
4. Wash your hands. ...
5. Sleep tight.

Food service workers must maintain a high degree of personal cleanliness when receiving, storing, cooking, processing, packaging, transporting or disposing of food. Here are some basic tips to follow;

- Keep fingers away from your face, mouth, hair, skin and other parts of the body.
- Don't brush or comb your hair when you are near food.
- Wash your hands frequently.
- Never smoke in food areas.
- Do not handle food with bare hands – use gloves instead.
- Do not eat or chew gum in food handling areas.
- Don't cough, sneeze, spit or smoke near food and avoid touching your nose, teeth, ears and hair, or scratching when handling food.
- Do not use fingers to sample food. Always use a clean spoon.

Protective Clothing in the Food and Hospitality Industry. **Protective clothing** is used in almost every workplace, from commercial **kitchens** to building sites. It protects the wearer from injury due to blunt impacts, electrical hazards, heat, chemicals and more.

Why should protective clothes be worn by food handlers?

Please remember, in most industries (e.g. the car industry) employees **wear protective clothing** to protect themselves and their **clothing** from the materials with which they are in contact. In the **food** industry, **protective** coats, hats and gloves etc are **worn** to protect the **food** from the **handler**.

What is the purpose of protective clothing?

PPE is equipment that will protect the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment (RPE).

All staff must wear clean and appropriate clothes when handling food. Ideally, staff handling and preparing unwrapped food should put on a clean apron or tabard over

their **clothes**. **Clothes** can bring dirt and bacteria into food handling areas. Wearing **clean clothes**, aprons etc. helps to prevent this.

Why do food handlers wear protective clothing?

Wearing protective clothing when preparing and cooking **food** helps to protect both your customers and yourself. ... Clean aprons, gloves, towels and more will help you to hygienically prepare **food**, protecting your customers from **food** poisoning or injury.

1.3 POTENTIAL HYGIENE RISKS

Bacterial & other contamination arising from poor handling of food

- **Food poisoning** can be **caused by** eating **food contaminated** with **bacteria**, viruses, chemicals or poisonous metals such as lead or cadmium. ... Some **food poisoning** diseases are more common than **others**. For example, disease **caused by** Staphylococcus aureus occurs a lot more often than disease **caused by** Clostridium botulinum.

What signs might tell you that food has been contaminated by bacteria?

Nausea, Vomiting, Stomach pains, Diarrhea, Feeling weak, Fever or chills/sweating
Headache.

Q. What are the 5 most common causes of foodborne illness?

- The top **five** risk factors that **most** often are responsible for **foodborne illness** outbreaks are: Improper hot/cold holding temperatures of potentially hazardous food. Improper cooking temperatures of food. Dirty and/or contaminated utensils and equipment.

What type of food is easily contaminated by bacteria?

- **Raw** foods including meat, poultry, fish and shellfish, eggs, unpasteurized milk and dairy products, and fresh produce often contain bacteria that cause foodborne illnesses. Bacteria can contaminate food – making it harmful to eat – at any time during growth, harvesting or slaughter, processing, storage, and shipping.

There are three ways that food can be contaminated:

- ✓ 1. Biological hazards (microorganisms) including bacteria, fungi, yeasts, molds and viruses.
- ✓ 2. Chemical hazards. including cleaning chemicals or foods with naturally occurring toxins, such as green potatoes.
- ✓ 3. Physical hazards.

POOR WORK PRACTICES/ UNHYGIENIC PRACTICES IN KITCHEN

1. Failure to sanitize your kitchen counter regularly

According to a microbiologist, Dr. Charles Gerba, people failed to clean their kitchen counter regularly, making it more unhygienic than the toilet seat. For thorough sanitation of the kitchen counter, he suggested to use paper towel and disinfectant kitchen cleaner in wiping it down. Throw the paper towel away after using it.

2. Rinsing but not sanitizing your cutting board

A lot of people use the same cutting board for meats, fruits, and vegetables and unfortunately, they ignore sanitizing these cutting boards. Raw meat on typical cutting board has 200 times more fecal board than a toilet seat. While people only rinse their cutting board, however, poultry and raw meat leave behind campylobacter and

salmonella according to Dr. Gerba. To keep cutting boards from germs, he suggested using different cutting boards for meat and vegetables. In addition, he suggested as well sanitizing the board using a kitchen disinfectant or placing it in the dishwasher.

3. Not changing out your sponge, dishcloth or scrub brush regularly

Every time sponges, dishcloths, and scrub brushes are left wet usually in the sink, they are exposed to more bacterial infestations. The advice from Dr. Gerba is to change dishcloths weekly and put the sponge into the dishwasher or microwave for thirty seconds. By doing this, bacteria will be killed keeping you safe from the illness they bring.

4. Not sanitizing the bottom of your sink.

According to the director of the University of Arizona's environmental health sciences, Kelly Reynold. The bottom of the sink is the filthiest area in the kitchen but people forget it often. A slimy film infested by many bacteria inhibits cracks or splits in around the sink because of the habit of rinsing raw meat. Moreover, the sink is an ideal place for the growth of E. coli because it's wet and moist.

And others.....

WHAT IS HYGIENE RISK?

It is particularly dangerous in the kitchen as large numbers of harmful bacteria can be transferred to food or food contact surfaces, increasing the **risk** of food poisoning.

Cross-contamination is also linked to standards of personal **hygiene**, cleanliness and sanitizing. Practices to apply the food handling principles.

What is difference between hazard and risk?

What is the **difference between** a 'hazard' and a 'risk'? A **hazard** is something that can cause harm, e.g. electricity, chemicals, working up a ladder, noise, a keyboard, a bully at work, stress, etc. A **risk** is the chance, high or low, that any **hazard** will actually cause somebody harm.

What is food hazard?

A food safety hazard is anything present in food with the potential to harm the consumer, either by causing illness or injury. Food safety hazards can be biological, chemical, or a physical object.

What types of hazards are there?

To ensure a safe work environment it is important to be aware of the hazards that may exist in your workplace. Most hazards can be broken down into one of three categories:

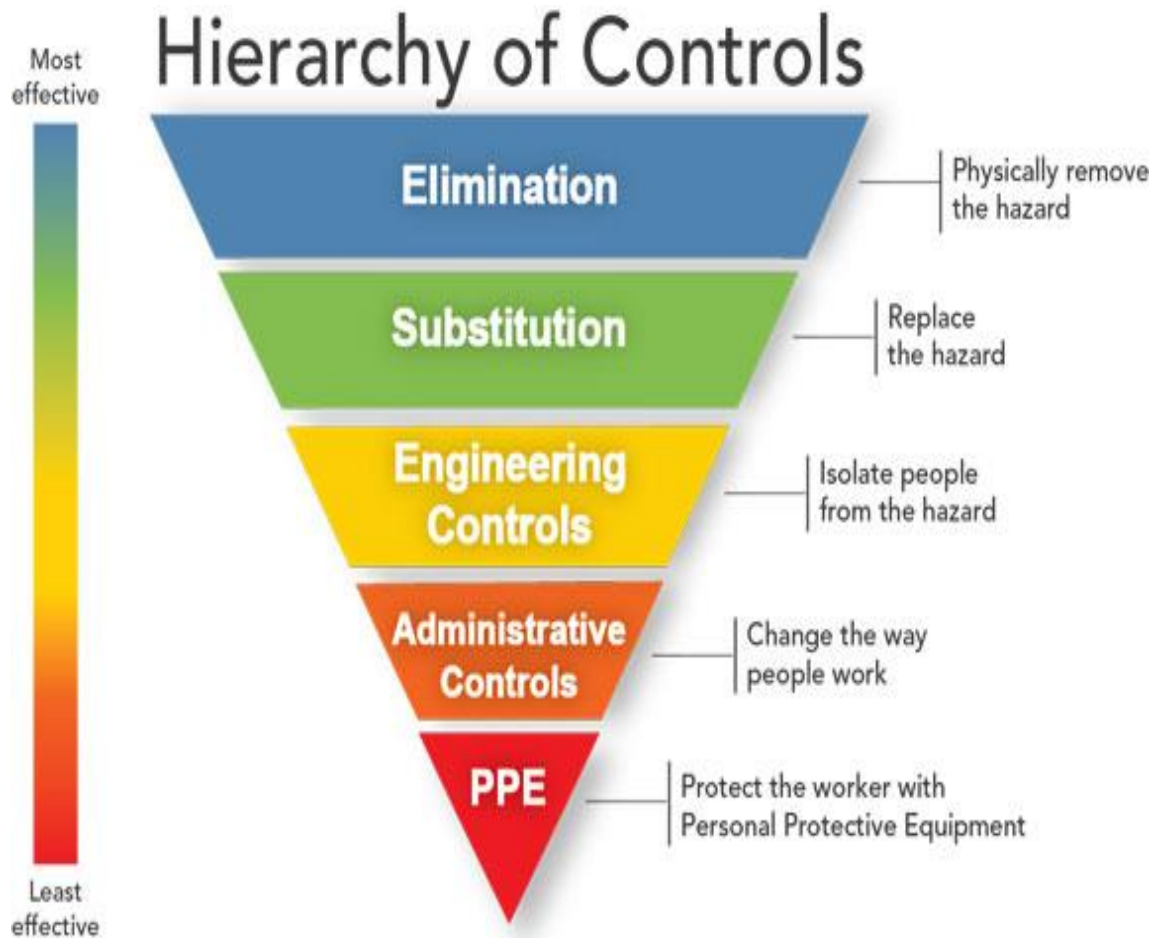
HAZARD TYPE	EXAMPLES
Physical Hazards	Noise, Light, Temperature, Radiation.
Biological Hazards	Mould, Viruses, Blood Bourne Pathogens, Animal Allergens.
Chemical Hazards	Acids, Bases, Organic Vapours.

How do I know if a hazard is dangerous to my health?

To determine if a hazard can result in adverse health effects, monitoring needs to be carried out through either personal sampling or area sampling using specialized equipment. The results from all monitoring are compared to Work Safe regulations or other applicable standards to ensure compliance. If compliance is not achieved then the necessary controls need to be implemented.

What are the main ways to control for hazards?

The hierarchy of controls should always be used to eliminate or reduce exposure to hazards.



What are some examples of controls?

CONTROL TYPE	EXAMPLES
Elimination/Substitution	Remove the hazard from the work site or replace the hazardous material and/or equipment with less hazardous ones
Engineering Controls	Introducing designs or modifications to buildings, equipment, ventilation systems, and/or process to reduce exposure levels
Administrative Controls	Introducing policies, guidelines, safe operating procedures and/or exposure control plans

CONTROL TYPE	EXAMPLES
Personal Protective Equipment	Introducing gloves, respirators, hearing protection, lab coats, and/or steel toed shoes

What is an exposure control plan?

Exposure Control Plans (ECP's) function to protect staff and students from exposures to hazards by outlining important information regarding that hazard.

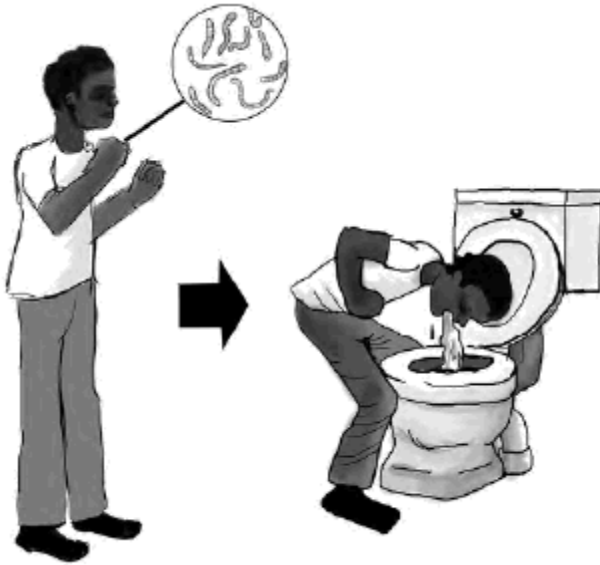
Food poisoning and contamination

Food poisoning

Everybody at one time or another has had the experience of eating food and sometime later becoming sick. This is called food **poisoning**. The symptoms may include:

- Nausea
- Vomiting
- Stomach pains
- Diarrhoea
- Feeling weak

- Fever or chills/sweating
- Headache



Food poisoning comes from harmful bacteria on food.

Food poisoning can be caused by eating food contaminated with bacteria, viruses, chemicals or poisonous metals such as lead or cadmium. Most food poisoning, however, is caused by bacteria and because of this, only bacteria will be discussed in this section.

Food which has become contaminated with harmful bacteria does not always taste bad. Most of the time it looks, smells and tastes like it normally does.

Some food poisoning diseases are more common than others. For example, disease caused by *Staphylococcus aureus* occurs a lot more often than disease caused by *Clostridium botulinum*.

Some foods cause food poisoning more than others and need to be cooked properly

and/or kept in the refrigerator. These include chicken, meat, seafood, eggs, cooked rice, ham, salami, milk and all dairy foods. It is important chicken is cooked properly to the bone and then kept in the fridge for no more than 2 days. If reheating chicken, or leftovers, make sure it is steaming hot and only reheat it once.

It is important to remember that the same food handling practices are used to prevent all food poisoning diseases. Washing your hands with soap and drying them on a paper towel or with a clean cloth is the best way to stop the spread of bad bacteria.

The four most common types of food poisoning bacteria are discussed below.

1. Staphylococcus

These bacteria are found on the skin, in sores, infected eyes and in the nose, throat, saliva and bowel of humans. There may be many of these bacteria in the yellow mucus (slimy substance) which comes from the nose or is coughed up when a person has a cold or a lung infection.

Staphylococci do not cause illness until they get onto food and grow and multiply. While they are doing this, they produce a toxin (poison). It is the toxin which causes the illness. The toxin is not destroyed by cooking the food.

Symptoms of staphylococcus food poisoning usually appear between 1 and 8 hours after eating the infected food.

2. Salmonella

There are hundreds of different types of salmonella bacteria but not all are harmful to humans. They are found mainly in the intestines, bowels and faeces of humans and other animals. It is the salmonella bacteria themselves which can cause salmonella food

poisoning.



Bacteria on food.

People can get salmonella food poisoning from:

- Poor food handling practices in the home or in food outlets
- Seafood caught in polluted water or eggs with dirty shells
- Meat or poultry which has been contaminated by poor food handling before it gets to the food outlet, such as at the abattoir

Salmonella food poisoning takes up to 48 hours to develop after the food is eaten.

Symptoms include nausea, stomach cramps, diarrhoea, fever and headache, and may last between 3 and 21 days. It can cause death in very young, weak or very old people.

People who have cancer or are taking medication for serious health conditions such as heart, kidney or liver problems need to also be particularly careful that they eat safe food.

3. Clostridium

These bacteria are found in the soil and in the intestines of animals, including cattle, poultry, fish and humans. Food poisoning caused by clostridium bacteria is important to know about because these bacteria are common in the environment.

People can get clostridium food poisoning from poor food handling practices in the home, in the factory or in a food outlet, especially relating to cooking and storage/refrigeration temperatures.

Clostridium food poisoning symptoms occur about 12 hours after eating the contaminated food and are similar but usually less severe than the other types.

Symptoms include stomach pains, diarrhoea and sometimes nausea and vomiting. Symptoms last about 24 hours.

One type of clostridium bacteria produces a very serious food poisoning disease called **botulism**. This disease is caused by eating food which is contaminated with an extremely poisonous toxin produced by the bacteria Clostridium botulinum. Unless properly treated about one-third of people who get this disease die within 3-7 days.

4. **Campylobacter**

These bacteria are found in many animals including dogs, cats, cattle and poultry. The sources of infection from these bacteria are usually contaminated food and water.

People can get campylobacter from:

- Ingestion of contaminated food or water (especially undercooked chicken & creek or river water)
- Contact with infected animals (especially puppies or kittens with diarrhea)

- Poor food handling (especially by using the same chopping boards, knives and plates for raw and cooked chicken)

Campylobacter food poisoning symptoms usually last from 2 to 5 days. These include diarrhea, severe abdominal pain, vomiting and fever. It is a serious disease in Indigenous communities because of the possibility of dehydration from diarrhoea.

8.2 How bacteria grow and multiply

Bacteria reproduce (breed) by splitting in half. When they do this, they are said to **multiply**. In the right conditions, bacteria multiply at a very fast rate.

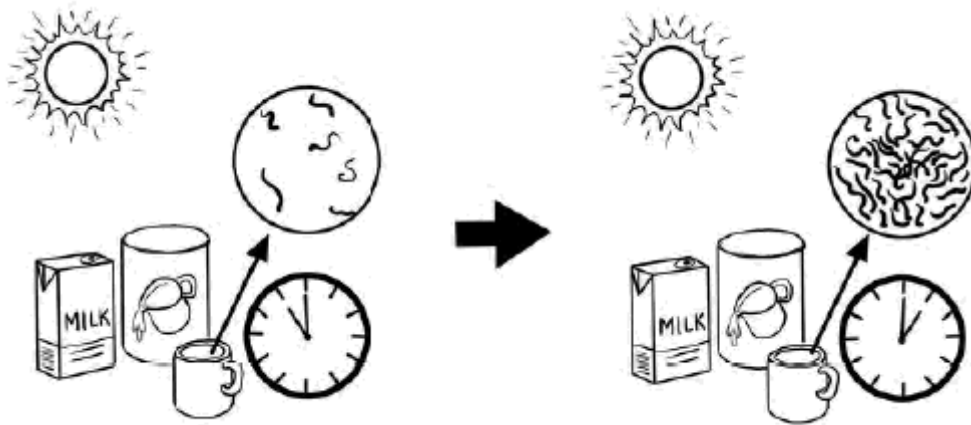


Fig. 3.28: Bacteria can multiply very quickly.

Disease causing bacteria grow best when there is:

- warmth (37°C-38°C) (Note: human body temperature is 37°C)
- moisture
- food supply

In ideal conditions, bacteria double their numbers every 20 minutes. For example, if a piece of kangaroo meat infected with 100 food poisoning bacteria is left lying on a kitchen bench on a warm day, the bacteria will double their number every 20 minutes,

and in 3 hours, the 100 bacteria will multiply to over 50,000 bacteria.

The following table shows how the bacteria will multiply on the meat over 3 hours:

Time	Number of bacteria
Start	100
20 minutes	200
40 minutes	400
1 hour	800
1 hour 20 minutes	1600
1 hour 40 minutes	3200
2 hours	6400

2 hours 20 minutes	12800
2 hours 40 minutes	25600
3 hours	51200

It is important to note that once inside a person's intestine the bacteria can continue to multiply. This means that a person may eat contaminated food having only a few bacteria on it, but eventually suffer from food poisoning.

Ways food can become contaminated through incorrect food handling

Food can become contaminated with disease-causing bacteria anywhere the food is handled or stored. These places include:

- In a factory where it is processed ready for sale
- In a truck in which it is taken from the factory to the shop
- In a shop
- In a food outlet such as a school canteen or take-away shop
- Between the shop and home
- In a home

Most food has to be prepared in some way before it is eaten. During this preparation the food is handled by people. There are many ways in which unhygienic practices can

cause food poisoning bacteria to be deposited on the food while it is being handled.

Some examples are:

- Leaving food uncovered. Pets, flies, cockroaches and other insects carry germs, including food poisoning bacteria, which contaminate the food
- Touching parts of the body while handling food. While preparing food a food handler might scratch a pimple, touch a sore, push back hair, scratch an ear or rub or pick the nose. Every one of these activities contaminates the fingers with bacteria. If the person's hands are not washed before handling food again, these bacteria will be passed to the food.



Figure 1. Rubbing the nose while preparing food helps spread germs.

- Sneezing or coughing near food. If a food handler, or anyone else, sneezes or coughs near uncovered food, then the food almost will certainly be sprayed with bacteria laden droplets.



Fig 2. Sneezing over food spreads germs.

- Licking fingers while handling food. Human saliva carries staphylococcus bacteria and licking the fingers could result in these bacteria being passed to the food.



Fig 3. Licking fingers while handling food spreads germs.

- Not washing hands after going to the toilet during food handling. If a person goes to the toilet during food handling activities and does not wash his/her hands afterwards food poisoning bacteria may be passed onto the food.

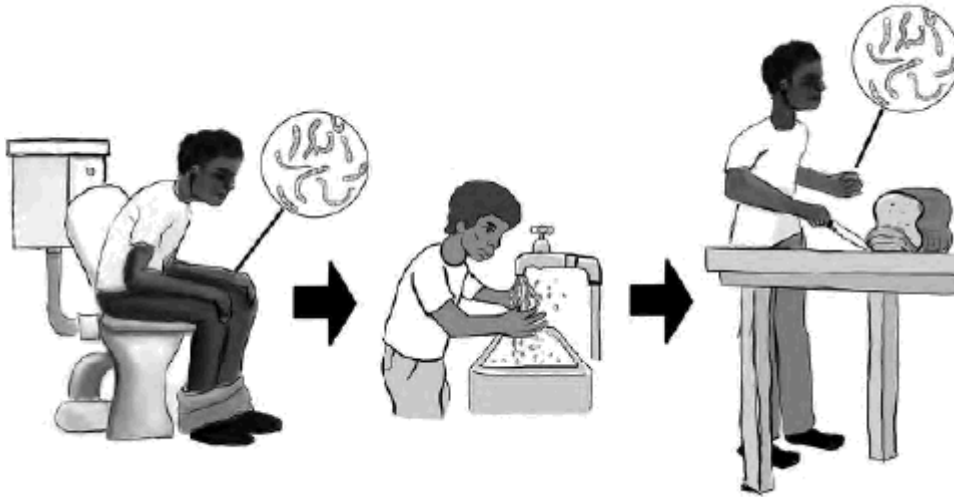


Fig 4. Washing hands after going to the toilet helps stop the spread of germs.

- Poor handling of high-risk foods. High risk foods are those which generally need refrigeration and have a high moisture content. Poor handling of high-risk foods is a common cause of food poisoning. High risk foods include:
 - Chicken, duck and other poultry
 - Fish and shellfish
 - Raw meat products
 - Dairy products (milk, cheese, cream)
 - Unpasteurized cow or goats' milk
 - Eggs and egg products
 - Gravies

Cross contamination. Certain foods will always contain some bacteria. Poor handling of these foods may result in **cross contamination**. Cross contamination is the passing of

bacteria from contaminated food to uncontaminated food. Cross contamination can occur when storing or handling food.

An example of cross contamination during storage is:

A high-risk food, such as a raw chicken thawing in a refrigerator, is placed in contact with cooked meat. The bacteria from the raw chicken contaminates the cooked meat. Since the cooked meat is not heated again before eating, the bacteria from the chicken pass to the person who eats the meat.

An example of cross contamination during handling is:

Before cooking a fish, which is contaminated with salmonella bacteria, a person uses a knife and cutting board to cut it up. Bacteria from the fish will be left on the knife and cutting board. The person slices cooked ham using the same knife and board without washing them first. The bacteria are transferred to the ham.