168 Demonstrate knowledge of food contamination hazards, and control methods used in a food establishment.

Innovative Hospitality Student Resource

Welcome & Introduction

Food Contamination

Food Borne Illness

Controlling food

Welcome

This is the Innovative Hospitality Learning for 168 Demonstrate knowledge of food contamination hazards, and control methods used in a food establishment

Unit Standard:	Version:	Credits:	Level:
168	8	4	3

We encourage you to use your skills and knowledge from your workplace and this learning to help you gain your qualifications and prepare for your assessment.

Course Aim

People completing this unit will be able to identify food hazards and sources of contamination. They will know the causes and signs of food spoilage and food borne illness and be able to implement systems to prevent these and control the growth of bacteria.

Course Objectives

Knowledge of food borne hazards

- Hazard and identification
- Source of contamination
- Characteristic of bacteria, mould and yeast
- Food borne illnesses
- Causes and signs of food spoilage

Methods used to control hazards

- Prevention of cross contamination
- Kill or control bacteria and fungi
- Other forms of control
- Prevention of food spoilage
- Principles of HACCP (Hazard analysis and critical control points

The Assessment

The NZQA set the standards and outcomes for this unit. ServiceIQ who are the Industry Training Organisation for the hospitality industry pre moderate and post moderate the assessment for this unit. There is a written assessment to complete which confirms your understanding of food safety practices.

Food Safety and Legislation

The Food Act 2014 took effect on 1 March 2016 and became fully in force from 1 March 2019. It helps make sure that food sold throughout New Zealand is safe.

Go to following website for more information http://mpigovtnz.cwp.govt.nz/food-safety/food-act-2014/

The Act promotes food safety by focusing on the processes of food production, not the premises where food is made. For example, someone who makes and sells food from a food truck must follow the same rules as someone who makes and sells food at a restaurant.

The Act introduced other changes, including: the way food recalls are managed; changes for food importers, and penalties and enforcement.

Who enforces New Zealand's food laws?

Food safety officers (previously known as Food Act officers) are responsible for enforcing the Food Act. They investigate non-compliance and complaints regarding the safety and suitability of food.

All food safety officers are employed by either MPI or a local council, and along with Public Health Officers they investigate any situation where food safety may have been compromised. New Zealand's food legislation applies to all food for sale in New Zealand and food that is exported.

Sources of food contamination that may cause food borne illness

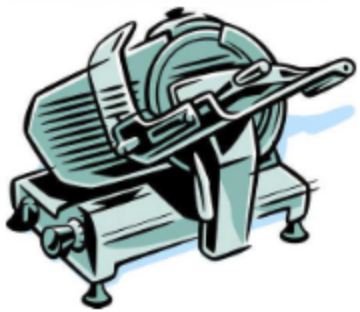
Food contamination is caused by something that shouldn't be in it or on it and its not supposed to be there.

Contaminants can be:

- BIOLOGICAL
- PHYSICAL
- CHEMICAL/METAL

Biological

Physical



Chemical/Metal

Food Contaminants

Food contaminants can come from lots of different sources.		
People Contamination by poor food handling and personal hygiene	Bacteria and Viruses Perfume, Hand Sanitiser Hair, dandruff, dirt	Biological Chemical Physical
Food	Cross contamination between food types with bacteria or fungi Naturally occurring toxins Eggshells, bone fragments, fruit pips Allergens such as peanuts and seafood	Biological Chemicals Physical Chemical/biological
Soil	Soil, dust, dirt Pesticides, fertilisers, and chemicals	Physical Chemical
Equipment Contamination from dirty equipment	Bacteria, viruses, fungi Naturally occurring toxins Allergens such as peanuts and seafood Detergents and sanitisers	Biological Chemical Biological Chemical
Buildings	Soil, dust, dirt, paint chips Pathogens from Pests	Physical Biological
Storage areas	Pathogens from Pests Dust and dirt if not cleaned Non Edible chemicals stored in same area.	Biological Physical Chemical
Preparation areas	Bacteria, viruses, fungi Naturally occurring toxins Allergens such as peanuts and seafood Dust and dirt if not cleaned	Biological Chemical Chemical/Biology Physical

Food Contaminants

Food contaminants can come from lots of different sources.		
Preparation areas	Bacteria, viruses, fungi Naturally occurring toxins Allergens such as peanuts and seafood Dust and dirt if not cleaned	Biological Chemical Biological/ Chemical Physical
Pests	Pathogens from Pests such as rats and mice Dust and dirt, urine and faeces Contamination with insects	Biological Biological Biological
Rubbish	Pathogens from pests such as rats and mice Pathogens growing in rotting decaying food waste Chemicals from waste Broken glass, metals, plastic or other non-edible waste	Biological Biological Chemicals Physical
The Air	Air borne pathogens such as bacteria, viruses, fungi Air borne dust, dirt, smoke, fumes Dirty rain contaminated with any of the above	Biological Chemical/Physical Biological, Chemical and Physical
Water	Pathogens such as bacteria, fungi and viruses e.g. from bird faeces in rainwater tanks, animal faeces in streams Dirt, sediment, sewage especially during flooding Chemical in treated water or untreated water Fertiliser/pesticide runoff from farms into streams other water-borne pollution.	Biological Physical/Biological Chemical Chemical

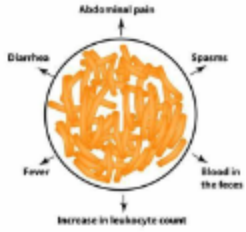
Types of Food-Borne Illness

Salmonella

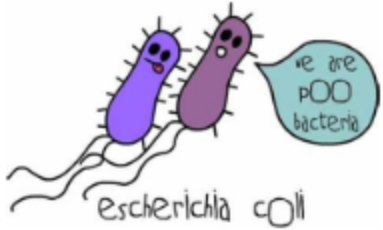
CAMPYLOBACTER

Bacillus Cereus

CLOSTRIDIUM DIFFICILE



Yersinia enterocolitica



Listeria monocytogenes

Yersinia Enterocolitica

Types of Food-Borne Illness

Name of bacterium	Common Sources of contamination	Commonly contaminated food
Salmonella	Intestinal Tract of animals, birds and humans – faecal contamination	Raw Eggs, raw milk, meat and poultry
Campylobacter	Soil, sewage, water, intestinal tract of animals, humans- faecal contamination	Raw Milk, eat and chicken
Clostridium	Soil, dust, water	Canned and prepared foods, meat dishes, sauces and soups
Bacillus Cereus	Soil, dust, cereals and dried foods	Cooked rice and pasta
Listeria Monocytogenes	Soil or infected animals	Raw Milk, Soft cheeses , raw vegetables and salads
Yersinia Enterocolitica	Water, soil, animals (particularly pigs)	Meat and meat products
Escherichia Coli	Intestinal tract of humans and other animals especially livestock (sheep, cows etc(faecal contamination	Raw or rare meat, cheese, vegetables and salads
Staphylococcus aureus	Food Handlers (skin, nose, wounds)	Ham, meat, poultry, cream, cheese

Types of Food-Borne Illness

Norovirus

Sources of contamination
People infected with the virus, contaminated water, contaminated food, equipment and surfaces
How does it get onto food?
Poor food hygiene, vomit or faeces, not washing hands, contamination with water containing the virus
How to stop it getting into food?
Exclude sick people
Workplace and personal hygiene
Hygienic work practices

Influenza/Col

Sources of contamination
How does it get onto food?
People infected with the virus, contaminated water, contaminated food, equipment and surfaces
How does it get onto food?
Coughing, sneezing, over/near food, contamination from hands not washed after sneezing, coughing or wiping nose.
How to stop it getting into food?
Exclude sick people
Workplace and personal hygiene
Hygienic work practices

Hepatis A

Sources of contamination
People infected with the virus, contaminated water, contaminated food, equipment and surfaces
How does it get onto food?
Poor food hygiene, faecal contamination, not washing hands, contamination with water containing the virus
How to stop it getting into food?
Exclude sick people
Workplace and personal hygiene
Hygienic work practices

How could you stop people from being sick from food contaminated with the virus ?
Cooking food, reheating foods or any other food preparation that would kill viruses before someone eats it
Discarding food suspected of being contaminated

Illness caused by allergic reactions to food

Peanuts

Peanut Butter
Satay Sauce
Toasted Peanuts

Exclude it completely
Check products for the ingredient
Separate processing areas.
Clean equipment

Shell Fish

Oyster Sauce
Prawn meat
Pipi Fritters
Abalone/Paua Fritters

Exclude it completely
Check products for the ingredient
Separate processing areas
Clean Equipment

Dairy Products

Cream
Custard
Cakes
Breads

Exclude it completely
Check products for the ingredient
Separate processing areas
Clean Equipment

Other Causes of Food-Borne Illness

Cleaning and Sanitising chemicals	Natural Plant Toxins	Natural Plant Toxins
Detergents, dishwashing powder, bleaches and sanitisers	Potatoes (solanine) rhubarb (oxalate) red kidney beans (Phytohemagglutinin), Parsnips (phototoxic chemicals)	Fly spray, rat poison,pesticides,fertilisers and other farming/horticultural chemicals on fresh foods
Any poor food handling procedure that permits contamination of food for example: • Storing harmful chemicals near foods • Not rinsing chemicals from equipment or utensils before preparing food with them	Using any of these foods as ingredients in dishes, without preparing or cooking them to remove or neutralise the toxin.	• Any poor food handling procedure that contaminates food with spray or pest control chemicals for example storing or using harmful chemicals near food. • Using fresh foods sourced from growers that use pesticides and other chemicals during production
Any good food handling procedures that prevent contamination of food with cleaning and sanitising chemicals such as: • Storing food and chemicals safely and away from each other • Cleaning up/rinsing away chemicals • Sorting chemicals in clearly labelled containers to make sure they are not confused with foods to prevent accidental contamination	Avoid using any of these foods as Ingredients in dishes in their toxic state. Clean any utensils used to prepare these foods to prevent cross contamination of the toxins to other foods.	• Avoid using fly sprays, rat poison for pest control in the workplace. • Use fresh foods from an approved pesticide or chemical free source (e.g. Organic or Spray Free. • Use good handling procedures that prevent cross-contamination of food with fly spray or pest control chemicals for example storing or using harmful chemicals away from food
Any good food handling procedures that prevents contaminated food from being eaten such as: • Washing chemicals off contaminated foods-if that is safe (for example you could wash detergent off a whole pumpkin which is peeled later • Throwing away and not using contaminated foods.	Any good food handling procedures that prevents contaminated food from being eaten such as: • Washing chemicals off contaminated foods-if that is safe (for example you could wash detergent off a whole pumpkin which is peeled later • Throwing away and not using contaminated foods.	• Any good food handling procedure that prevents food contaminated with pesticides or fertilisers from being eaten • Throw away and not using any contaminated food.

Other Causes of Food-Borne Illness

Giardia	Cryptosporidium
Untreated water contaminated with faeces(including birds, animals and humans) that contain Giardia cysts	Untreated water contaminated with faeces(including birds, animals and humans) that contain Cryptosporidium cysts
Preparing or cooking food in contaminated water Any poor food hygiene procedures that allow faeces to contaminate food.	Preparing or cooking food in contaminated water Any poor food hygiene procedures that allow faeces to contaminate food.
Prepare food using clean/and or treated water Any good food handling procedures that prevent faecal contamination of food	Prepare food using clean/and or treated water Any good food handling procedures that prevent faecal contamination of food
Preparing or cooking food to kill the parasites Throwing away and not using contaminated food.	Preparing or cooking food to kill the parasites Throwing away and not using contaminated food.

Other Causes of Food-Borne Illness

Mercury	Cadmium	Aluminium
• Contaminated water • Seafood, particularly shellfish and large carnivorous fish e.g. tuna, shark. Note: Freshwater fish usually is not a risk.	• Contaminated water • Seafood, particularly shellfish and large carnivorous fish e.g. tuna, shark. • Liver, kidneys and mushrooms	Aluminium cookware, equipment or utensils
• Preparing or cooking food in contaminated water • Using at risk seafood in dishes	• Preparing or cooking food in contaminated water • Using at risk seafood/liver kidneys or mushrooms in dishes • Contaminated foods can cross contaminate other foods.	• Preparing or cooking food using aluminium cookware, equipment or utensils especially acid foods which dissolve aluminium. • Contaminated foods can cross contaminate other foods.
• Prepare food using clean and or treated water • Any good food hygiene procedures that prevent cross-contamination of food with mercury • Purchase and/or use only fish from an accredited cadmium free or low risk sources.	• Prepare food using clean and or treated water • Any good food hygiene procedures that prevent cross-contamination of food with cadmium. • Purchase and/or use only fish, liver, kidneys or mushrooms from an accredited cadmium free or low risk sources.	• Prepare or cook food using cookware or utensils not made from aluminium • Any good food handling procedure that prevents cross contamination of food with aluminium.
There is no way to decontaminate food contaminated with Mercury so the only ways to prevent illness from mercury contamination are: • Do not use any seafood for any source suspected of being at risk from mercury contamination • Throwing away and not using contaminated foods	There is no way to decontaminate food contaminated with cadmium so the only ways to prevent illness from cadmium contamination are: • Do not use any seafood for any source suspected of being at risk from cadmium contamination • Throwing away and not using contaminated foods	There is no way to decontaminate food contaminated with aluminium so the only ways to prevent illness from aluminium contamination contamination are: • Do not use any aluminium cookware, equipment or utensils for any source suspected of being at risk from cadmium contamination • Throwing away and not using contaminated foods

Methods to control bacteria and fungi in food

Stages	Procedures
Buying	• Purchase clean uncontaminated food from an approved supplier • Purchase foods well within their use by dates
Taking Delivery	• Temperature checks to make sure deliveries meet critical limits (e.g. food is not in the danger zone) • Check goods are within expiry dates • Physical inspection of packaging to make sure there is no damage • Keep delivery areas clean
Storing	• Regular temperature checks • Physical inspections to ensure there is no pests infestation • Ensure there is adequate airflow are the stored goods so that they remain cool and well ventilated. This decreases the chance of bacteria fungal or mould growth • Store cooked foods separately from raw foods to avoid cross contamination
Preparing	• Wash hands regularly and maintain required levels of personal hygiene to avoid introducing contaminants • Keep food chilled until needed so it is kept out of danger zone • Thaw food in a fridge. • Conduct visual checks on food before using to make sure it is not spoiled or damaged • Use separate utensils to prepare and raw and zone cooked foods (wash and sanitize between use) to avoid cross contamination.
Cooking	• Cook food to correct temperature and for the correct time so bacteria are killed • Chill cooked foods as fast as possible if not being served immediately
Cooling/ Chilling	• Chill cooked food as quickly as possible if not being served immediately so that it is kept out of the danger zone
Reheating	• Cook food to correct temperature and for the correct time so bacteria are killed • Reheat only once
Serving	• Clean and sanitise equipment before use so that cross-contamination does not occur • Use clean tongs and serving equipment with handling food
Selling	• Display chilled food cool enough so outside the danger zone • Hold hot food above 60° to avoid bacteria growth.

What is HACCP and what are the 7 principles of HACCP?

Hazard Analysis and Critical Control Point (HACCP) is an internationally recognised system used to identify and manage significant food safety hazards, and ensure food safety for your business. HACCP can be used throughout all stages of the food chain, from primary production to final consumption. It has 7 key principles.

1. **Identify hazards — Biological, chemical, and physical hazards that could be reasonably likely to occur in food ingredients should be identified along with available control measures. The MPI hazard database assists with information on reported food safety hazards that can occur in New Zealand food ingredients.**
2. **Determine critical control points (CCPs) — A CCP is a step at which control can be applied to prevent, eliminate or reduce a food safety hazard to an acceptable level.**
3. **Establish critical limits for each CCP — A critical limit provides the measure for separating acceptability from unacceptability at a CCP.**
4. **Establish CCP monitoring requirements — Suitable monitoring activities are necessary to ensure that the CCP is under control.**
5. **Establish corrective actions — These are the actions to be taken when monitoring shows a CCP is out of control. That is, a critical limit has been exceeded. Actions include: restoring control at the CCP, making decisions on product disposition, and preventing re-occurrence of the CCP failure.**
6. **Verifying the HACCP system is working as intended — Within-business verification is required to ensure that your HACCP application is complying.**
7. **Establish record keeping procedures — HACCP documentation must be correctly maintained, including: identification and analysis of hazards, CCP determination, and critical limit determination. Records are also kept for tracking CCP monitoring, corrective actions taken and HACCP system verification.**

Methods to control bacteria and fungi in food

HACCP requires an understanding of the hazards and the critical control points (CCP) to kill or control bacteria and fungi growing in food, through the correct preserving method. These are four methods.

Freezing CCP Controlling Temperature ensuring frozen food is maintained at -18 or less. The food is stored at a temperature below -18° so that bacteria cannot grow or reproduce or are killed

Vacuum Packing CCP Controlling Oxygen to remove air from food. Many aerobic bacteria and fungi need oxygen to grow and reproduce. Vacuum packed food has most if not all air removed from it so that bacteria and fungi cannot grow, grow very slowing or are killed.

Drying CCP = Controlling Moisture to remove water
Bacteria and fungi need water to grow and reproduce. Dehydrated food has all or nearly all the water removed so that bacteria and fungi cannot grow or are killed

Pickling CCP = Controlling the PH of food to not be neutral
Bacteria and fungi need a near neutral PH to grow and reproduce. Pickled food is preserved in acid solution)e.g. Vinegar or lactic acid – salt fermented pickles which is too acid for most bacteria to grow.

Food Spoilage

Food spoilage is when the appearance , taste por texture of food changes (goes off) so that it is not fit to eat or use. Sometimes spoiled food can make people sick.

Biological

Any Bacteria or fungi that spoils food

Furry, Slimy, mushy, odd colour, smell

Keep food cold, Keep food in containers

Physical

Drying out, freezer burn, squashed , broken

Damaged look

Covering food, wash away soil

Chemical/Metal

Chemical Changes in Fruit

Unusual smell or texture, browning

Keep in fridge, don't buy bruised fruit

Food Control Plans

What is a FCP:

A Food Control Plan (FCP) is a written food safety plan for a business. By law the FCP needs to be approved by MPI to make sure it meets all required standards for maintaining food safety.

What is the purpose of a FCP

It sets out what steps a business making or selling higher-risk foods needs to take to make safe food. It is used by businesses to identify hazards , critical control points and to show how they're being managed. It means customers will know the food is safe and it can help you create a successful food business.

How does a FCP help a business meet it's legal obligations to control food contamination hazards? By:

1. Identifying and recording all the risks to food safety.
2. Setting out workplace requirements and procedures that everyone must follow to keep food safe; for example, procedures to prevent cross contamination.
3. Monitoring and keeping records of workplace activities which make sure, and show that, food safety procedures are always followed correctly; for example, checking fridge temperatures are in the 'safe' range', and recording the food safety training employees have received.
4. Proving to food safety authorities that they are meeting their food safety obligations under the Food Act 2014.