FOOD HYGIENE

# INTRODUCTION

Consumers of food should expect that the food they eat tastes good and is nutritious. It is extremely important that the food does not harm them in any possible way.

Food handlers must aware of the various principles of good practice when handling food and that they behave responsibly at all times.

Several food safety procedures will be in place in work places and it is expected the food handlers are aware of and adhere to these procedures at all times.

# FOOD SAFETY DEFINITION

Food Safety is ensuring that food prepared is protected from anything that could cause injury, harm or potentially death to the consumer.

Food is defined as anything that people normally eat or drink.

# FOOD HYGIENE DEFINITION

Food Hygiene is the actions taken by food handlers to ensure that all food is handled, stored, prepared and served in a way that prevents it from becoming unsafe.

# WHO IS A FOOD HANDLER?

Anyone involved in the handling of food or whose action or inaction could have an effect on the safety of food during the course of food preparation.

# FOOD POISONING DEFINITION

Food poisoning is the illness caused by eating contaminated or poisonous food. In most instances it occurs quickly after the contaminated or poisonous food is consumed.

# Symptoms of Food Poisoning

* Feeling nauseated
* Diarrhoea
* Vomiting
* Stomach ache

As a result of these symptoms dehydration can occur to the person that has consumed the food. Victims of food poisoning may encounter some or all of the symptoms.

Many people are affected by food poisoning daily with serious consequences including death in the most severe cases.

Those most at risk of poisoning:

* + The Elderly
  + Babies
  + Pregnant Women
  + The ill / those with weak immune system (this is particularly relevant in

Healthcare settings)

The main causes of food poisoning:

* + The dereliction of duty
  + Ignorance
  + Failure to implement or follow procedures in the work place
  + Poor management within establishments that handle food

# FOOD SAFETY LAW

Food safety law has been created to protect the public from food that is unfit to eat and may cause them illness or physical harm.

Those who work with food or persons whose work could potentially affect the safety of food (such as a cleaner) have a legal and moral responsibility to make sure the food that they handle is fit for consumption.

# What legal responsibilities do food handlers have?

Food handlers have the legal responsibility to:

* + Ensure they are clean
  + Ensure their working environment is clean
  + Wear the correct protective clothing and ensure it is kept clean
  + Protect food from any possible contamination
  + Avoid doing anything that would expose food to any risk of

contamination

* + Store, prepare and display food the handle within specific temperature ranges
  + Refrain from working with food when displaying symptoms of food poisoning
  + Report certain illnesses and conditions to their superiors
  + Refrain from selling / providing food that is not fit to be consumed
  + Not sell food that has an expired ‘use by date’ displayed

# What legal responsibilities do managers have?

* + Their premises must be registered with the local authority
  + Their premises must be designed, constructed, maintained and operated

in a manner to prevent food contamination

* + That there are sufficient washing and personal hygiene facilities for staff
  + Ensure staff working for them are trained to an appropriate level and are

supervised to work in a hygienic manner

* + They must also ensure that any food hazards are assessed and actions

are taken to stop or reduce risks to food safety

# What training should food handlers undertake?

All food handlers must have received sufficient training and be supervised appropriately to be able to do their job correctly and safely.

Food handlers must be made aware of the specific hazards they may encounter at their place of work and how these can be controlled.

Detailed records of the training must be kept, (i.e. the type of training completed and the date it was completed)

Training can be carried out at the food handler’s places of work. They may also attend courses (face to face or via e-­‐learning)

# The assessment of food safety hazards

Food safety law is in place to identify possible food safety problems in the production of food and to prevent any problems from occurring.

Running a food business in this manner reduces the chances of unsafe food being consumed by customers.

# HACCP

HACCP (Hazard Analysis Critical Control Point) is a food safety management system designed to help food handlers assess food safety hazards.

HACCP involves looking at every stage of food handling in the business and whether there are any potential risks to the safety of the food produced.

Through using the HACCP system measures can be put in place to control hazards that have been identified. Checks can be made to establish the measures put in place are working. Action would then be taken if there were a problem.

The controls and measures put in place must be reviewed regularly by management with changes being implemented should a problem be highlighted in the review process.

Detailed records should be kept regarding all actions taken.

# Implementing HACCP

Food businesses are required by law to have procedures based on HACCP principles which include:

* + Assess the food safety hazards in the workplace
  + Identify where hazards could occur
  + Assess whether the hazards are critical to food safety -­‐ critical control points
  + Implement controls for eliminating or reducing each hazard
  + Establish a monitoring system to ensure that the controls are effective
  + Set up procedures to correct any problems
  + Review the system, especially if anything changes
  + Document the assessment and ensure records are kept

A businesses HACCP system needs to be approved by the local Environmental Health Department.

# What is a food handler’s role in HACCP process?

Whatever your job role your responsibility in food safety control is as follows:

* + Adhere to the rules set out for your workplace
  + At all times ensure food is protected from contamination
  + Comply with food temperature legislation
  + Be mindful of any safety hazards in the workplace
  + Report faults, problems or possible food safety hazards to your manager

# WHO IS RESPONSIBLE FOR ENFORCING FOOD SAFETY LAW?

The following officials are responsible for enforcing food safety law:

* + Environmental Health Officers (EHO)
  + Trading Standards Officers (TSO)
  + Food Law Enforcement Officers

Their job entails:

* + Inspecting food premises and their practices.
  + Making sure the businesses they inspect and all food handlers working

within them are compliant with the law.

* + Prevent the risk of illness or harm caused by consumers eating or

drinking contaminated food.

# What powers do EHOs/TSOs have?

* + They may enter a food premises at any reasonable time
  + Close a food establishment immediately if there is an immediate risk to

food safety

* + Require businesses to make improvements if there are things wrong
  + Take away documents and samples of food for analysis
  + Investigate outbreaks of food poisoning
  + Take a company to court for breaching the law

# How would a company or individual defend themselves?

An individual or company can't be convicted of an offence if they can prove they have taken every reasonable step to avoid it.

A person accused of an offence may plead that they had taken all reasonable precautions and exercised all due diligence to avoid the offence being committed.

# How can it be proven that all reasonable precautions have been taken and due diligence has been exercised?

* + Business should have good systems in place
  + Staff should be trained appropriately for their job role
  + Records should be kept in line with HACCP principles. Without sufficient records it would be extremely difficult for a business to evidence that they have been working in a safe manner.

# The penalties for breaking food law

The following penalties can be enforced should a court decide that Food Law has been broken:

* + A monetary fine (potentially up to £20,000)
  + A prison sentence
  + Closure of the offending business
  + A criminal record
  + The business paying civil compensation to customers affected by their

poor practices

# WHAT ARE THE BENEFITS OF HIGH STANDARDS OF FOOD SAFETY?

* + Those consuming the food will not come to any harm from the food provided
  + The business will enjoy a good reputation and potentially increased

business

* + Compliance with the law
  + Less wastage of poor and unsafe food products
  + Job security

# WHAT ARE THE IMPLICATIONS OF POOR STANDARDS OF FOOD HYGIENE?

* Illness and discomfort for customers
* A poor reputation for the business and possible loss of business
* Possibility of prosecutions and fines
* Possible closure of the business

# Personal hygiene

Food handlers can cause two types of food safety hazard:

* Pathogenic bacteria (this can be due to poor personal hygiene standards)
* Foreign body hazards

The law states, "every person working in a food handling area shall maintain a high degree of personal cleanliness and shall wear suitable, clean and, where appropriate protective clothing".

The personal hygiene of food handlers is a vitally important.

Bacteria can live in or on the human body. The body temperature of humans is 37°C. This is an ideal temperature for the growth of most food poisoning organisms.

Food handlers must keep themselves extremely clean and shower daily to prevent against the transfer of bacteria.

# Hand hygiene

Hands must be routinely and thoroughly washed as they are the primary method of contamination in a food handling setting.

If at all possible food should not be touched with bare hands, instead tongs could be used to pick up foods. Even if foods are not directly touched by hands it could still be contaminated by utensils if these have been touched by unclean hands.

# How to wash your hands

* Hands should always be washed in the basin provided (never the sink used for washing equipment or food as this leads to contamination).
* A non-­‐hand operated water supply is preferred with comfortably hot water and unscented liquid soap (A bar of soap may carry bacteria from the last person who handled it).
* Once wet, soap should be rubbed vigorously into hands, ensuring each hand is cleaned, including the fingertips, between the fingers and the wrist and forearm. 15-­‐20 seconds should be spent rubbing soap in.
* It may also be necessary to use a nailbrush to clean under nails, particularly

after carrying out tasks such as handling raw meat or visiting the toilet. If

using a nailbrush it must be scrupulously clean, as a dirty nail brush can introduce more bacteria onto the hand.

* Rinse hands with clear running water to remove all soap and dirt before drying them.
* Hands should be dried in a hygienic manner such as an air dryer, paper towel or clean roller towel. Cloths, t-­‐towels or overalls should never be used as this causes contamination.
* Some organisations may require use of a hand disinfectant as well.
* Hands and wrists should be washed thoroughly throughout the day.

Fingernails should be cut short to prevent harbouring bacteria. They must be kept clean with no nail varnish as it can chip and flake off into food.

# When should you wash your hands?

* After using the WC
* Before commencing work and when you return to work after a break
* After eating, smoking, blowing your nose or touching your mouth, ears or

hair

* After handling waste food or refuse
* Between handling raw food and high risk foods
* After carrying out any cleaning activity

# Protective clothing

Food handlers should wear clothing that is clean, washable or disposable. Dirty clothing can store bacteria which may contaminate food should it touch it.

# Protective clothing should:

* Be in good state of repair with no rips, tears or areas which are frayed
* No buttons and if possible external pockets
* Always be worn in area where food is being prepared
* Only be worn at work and should cover any ordinary clothing entirely.

The nature of clothing worn will depend on the job role being carried out.

# Footwear should:

* Have low heels
* Be enclosed
* Have non-­‐slip soles
* Be kept clean

# Hair

Controls will be in place in your workplace in order to prevent loose hairs

contaminating food.

Food handlers may be asked to:

* Wear clean head coverings or hats which cover their hair
* Cover facial hair with nets
* Tie back long hair

Food handlers should not brush or comb their hair while wearing their protective clothing. The act of brushing and combing makes it more likely that hair will fall out. It is therefore more likely that hair may contaminate the food.

# Gloves

Food handlers may have wear gloves when carrying out specific tasks. The gloves should always be food grade and not designed for any other purpose.

Even if wearing gloves food handlers should wash their hands before putting them on. Hands should also be washed when the gloves are removed.

Changing gloves often reduces the risks of food being contaminated. This is particularly important when changing from handling raw meat to high risk foods.

# Jewellery

When at work food handlers should refrain from wearing the following:

* Watches
* Brooches
* Rings containing jewels or earrings

Not only can they can fall into the food, they can also store bacteria.

# Spit and mucous

Food handlers must avoid the following when at work as they can assist with the transfer of bacteria found in spit and mucous:

* Sneezing
* Picking your nose
* Touching your mouth and then food
* Biting your nails
* Licking fingers
* Blowing into bags to open them

# Cuts and Spots

Cuts and spots are an ideal breeding ground for harmful bacteria. Even cuts

that appear clean can host bacteria.

They should be covered at all times with a detectable waterproof dressing. They are usually coloured blue so that they are easily seen should they drop into food.

# FOOD HANDLERS AND ILLNESS

No food handlers experiencing the following should handle food:

* Diarrhoea
* Vomiting
* Heavy colds
* Skin infections
* Discharge from either the ears or eyes

Food handler should notify their supervisor if they are affected by any of the above.

In specific cases medical clearance may be required before a food handler can return to work as they may still be carrying harmful bacteria even when a-­‐ symptomatic.

# Unhygienic habits

Food handlers must:

* Wash their hands often and thoroughly
* Dry their hands thoroughly and on correct towels
* Never pick their nose
* Never spit, cough or sneeze over food
* Use a new and clean spoon each time when tasting food
* Wash their hands after smoking (Smoking should only take place in the

designated area)

# FOOD HAZARDS

A food hazard is anything that can cause harm to the person who consumes it.

# Food Hazards can come in the form of the following:

* Microbiological -­‐ bacteria, mould or viruses
* Physical -­‐ foreign bodies such as glass or metal.
* Chemical -­‐ cleaning products, pesticides or poisonous plants

If any of the above is present in food the food is considered to be contaminated.

# Allergens

Allergens are classed as a fourth food hazard. Food allergy is quite uncommon and normally causes symptoms within a few minutes of eating the offending food or being in contact with the relevant substance.

Common food stuffs people are allergic to are:

* Milk
* Egg
* Seafood
* Peanuts

# Symptoms of food allergy can include:

* A red and itchy rash
* Wheezing
* Vomiting
* Sudden collapse
* Anaphylactic shock

Anaphylactic shock is life threatening. The throat swells blocking the airway and there is a dramatic drop in blood pressure. The patient may also collapse and / or lose consciousness.

# What should you do if someone is suffering from anaphylactic shock?

* Do not move them
* Call for an ambulance immediately
* Some allergy sufferers may carry an adrenaline injection kit

# Preventing allergy-­‐related illness

People who have allergies will usually know what they should not eat. They may need help in knowing whether any of the foods they are allergic to are in a particular dish.

When dealing with an enquiry always be sure you know the recipe for a dish or ask your supervisor. Never guess, as this could be life threatening for the individual. Even miniscule amounts of an allergenic ingredient can have fatal results.

# Always:

* Wash your hands after handling allergens
* Segregate allergenic ingredients from others
* Make sure all allergenic ingredients are suitably packaged
* Use separate utensils, equipment and cloths
* Do not cross contaminate with allergenic ingredients
* Discard or clearly label contaminated products
* Thoroughly clean areas where allergenic ingredients have been handled
* Ensure allergenic ingredients on menu items are clearly labelled

# Microbiological hazards

Microbiological hazards are the primary cause of food poisoning. Food poisoning is preventable by following good hygiene practices.

To be able to control microbiological hazards we must first understand a little

more about them.

Control measures need to be put in place in order to prevent food contamination.

It is important to note that even if food is contaminated with harmful micro-­‐ organisms it is very difficult to ascertain this by sight, smell or tasting.

# What are control measures and why are they important?

Control measures are needed within food handling areas to:

* Prevent food becoming contaminated
* Prevent contamination in a food from getting worse
* Prevent contaminated food reaching the consumer

# What is a control measure?

Control measures are actions taken to prevent or minimise food safety hazards. For example, storing perishable food below 5°C is a way of controlling the

growth of bacteria

Food handlers must understand any food hazards that have been identified in their place of work and the controls that have been put in place to ensure they carry out their tasks efficiently and safely.

# Are all bacteria harmful?

The vast majority micro-­‐organisms are not harmful with some even being useful to humans. For example, penicillin is a micro-­‐organism which is used in medicine.

The bacteria that food handlers must be wary of are Pathogenic bacteria as they can cause food poisoning. It is almost impossible to detect pathogenic bacteria on food via taste or smell.

# Bacteria are living cells and are present in many places including:

* Air
* Dust
* Dirt
* Food waste and raw food
* Water
* Human bodies and the bodies of pets and pests
* Surfaces
* Equipment

In order for poisonous bacteria to cause food poisoning they must grow in large numbers. Food handlers should be familiar with the conditions required by bacteria to grow in order to stop them multiplying.

# The conditions required for them to multiply are:

* Food
* Moisture
* Warmth
* Time

Within these conditions food poisoning bacteria can quickly multiply to dangerous levels on food.

# What foods are most at risk from bacteria?

* Meat
* Poultry
* Shellfish
* Eggs
* Milk and products containing milk
* Rice

The above is a list of food susceptible to bacteria growth.

# CONTROL MEASURES FOR HIGH-­‐RISK FOOD

* Keep raw and high risk foods separate
* Cover food during storage
* Keep foods below 5°C or above 63°C
* Use tongs or other utensils to ensure foods are handled as little as possible

# Moisture

All living things need moisture to grow; most foods contain enough moisture for this to happen -­‐ especially high risk foods.

* Food poisoning bacteria are unable to grow on dried foods until they have

been reconstituted

* Large amounts of sugar or salt will absorb moisture, acting as an inhibitor to

bacterial growth

# BACTERIAL GROWTH WARMTH

**The Temperature Danger Zone**

Bacterial growth occurs between the temperatures of 5°C and 63°C (with the optimum temperature being 37°C) This is known as the temperature danger zone.

Most bacteria are killed at 70°C provided the food is cooked at this temperature throughout for a sufficiently long time. It should be noted that some bacteria can survive these temperatures.

# Foods are likely to spend time in the danger zone when:

* The food is left standing at room temperature
* The food is left in direct sunlight
* The food is heated to slowly
* The food is cooled to slowly
* When hot foods are topped up with cold foods

# What happens to bacteria at certain temperatures?

**TEMPERATURE CONDITIONS BACTERIA CONSIDERED**

Over 100°C Boiling Food / Pressure Cooker

73°C to 100°C Cooking Temperature (76.6°C)

Pasteurisation temperature

Most bacteria and spores killed in 10 minutes

Most bacteria die. All cooked food is best eaten directly after cooking

Safe

Safe

64 °C to 72°C Keeping food hot Most bacteria

can't multiply

Safe

5°C to 63°C Room Temp (10 -­‐ 36°C)

Body Temp (37 °C) Warm Food (38-­‐ 63°C)

1°C to 4°C Fridges and cold stores

Below minus 18°C Freezers below

freezing point

Bacteria able to multiply readily

Dormant -­‐ unable to multiply Dormant -­‐ unable to multiply (some are killed)

Danger!

Safe Safe

# How quickly can bacterial growth happen?

It is possible for one bacterium to divide into two every 10-­‐20 minutes.

The table below shows the number of bacteria that can grow from a single cell over time in the certain conditions:

|  |  |
| --- | --- |
| 1 HOUR | 3 to 6 |
| 6 HOURS | 524,880 to 33,562,320 |
| 12 HOURS | 254,561,000,000,000 to 1042,680,000,000,000,000 |
| 24 HOURS | 175,233,000,000,000,000,000,000,000,000,000,000+ |

This process is known as BINARY FISSION. Binary fission ("division in half") is a kind of asexual reproduction.

# Illnesses linked to food

There are two types of illness that can be caused by eating contaminated food. They are:

* Food poisoning
* Food-­‐borne illness

# How do pathogenic bacteria cause food poisoning?

There are three ways this can happen:

* Pathogenic bacteria that grow throughout the food in large numbers so that

when the food is consumed we ingest the bacteria also

* Pathogenic bacteria that are capable of forming a spore -­‐ a protective

coating that makes it difficult to kill with heat e.g. clostridium perfringens.

* Pathogenic bacteria that release toxins (poison) into the food before it is

eaten e.g. Staphylococcus Aureus.

In this last case it is the toxins that cause the illness. Toxins cannot be destroyed with heat.

# Spores

Some pathogenic bacteria can form a spore, which is as a protective coating. This coating makes it more difficult to kill.

Heat causes the activation of these bacteria into its spore. If the spore is then exposed to suitable conditions later it can change into the usual form of bacteria and multiply rapidly.

Spores can withstand disinfection and high cooking temperatures and are also able to survive in conditions where nutrients or moisture are not immediately available.

To prevent spores from germinating into harmful bacteria, cooked foods should be cooled as quickly as possible and refrigerated so the spores don't have time to germinate.

Spores themselves, if ingested, do not cause illness.

# Food-­‐borne diseases

Some diseases are passed on to humans by micro-­‐organisms carried by food or water. Only a few of these organisms are needed to give you a food-­‐borne disease. The incubation period can be days, weeks or even months. The infection can invade the blood stream, causing serious long-­‐term health problems.

# Other microbiological hazards

In addition to pathogenic bacteria, other microbiological hazards include viruses and parasites.

# Viruses

Viruses are smaller than bacteria; they can be carried on food and water but do not need it to survive. The two main sources of viruses are sewage and polluted water.

Viruses can contaminate any type of food but are generally associated with water, shellfish and raw foods. One example of a virus is Norovirus.

# Parasites

A parasite lives in or on other organisms, using them as a "host". Examples include roundworms, flatworms and flukes that affect animals such as fish, pigs and cows.

Others are microscopic organisms found living in water. Meat and fish should be cooked thoroughly to kill any parasites present in raw food.

# WHAT CONTROLS DO WE HAVE TO PREVENT FOOD POISONING?

**There are 3 main controls:**

* Stop the contamination of high risk food
* Stop bacteria multiplying to dangerous levels
* Kill bacteria present by thorough cooking / chemical preservation

# What is meant by hygiene control?

Hygiene control is the adoption of practices that will reduce the risk of food becoming contaminated. The aim of hygiene control is to prevent the spread of bacteria.

# How pathogenic bacteria contaminate high-­‐risk food

Contamination happens because of poor hygiene practices within the workplace.

Contamination can occur directly from the source of the food poisoning bacteria e.g. raw food in contact with cooked food, or blood dripping from raw meat / poultry onto high risk food. Indirect transfer of contamination happens when bacteria are transferred to a high-­‐risk food e.g. via a knife, cloth or work surface.

This is called cross-­‐contamination

Prevention of contamination depends on food being handled correctly from delivery through to service. Food handlers have a responsibility to prevent cross contamination.

# How can we control food-­‐to-­‐food contamination?

Food handlers should always assume that raw meat and poultry are heavily infested with bacteria when brought into the food area. The following can help prevent cross contamination:

* Identify separate parts of the work area for dealing with raw meat / poultry and foods that are already ready to eat without further treatment e.g. cooked foods.
* Keep other raw foods away from foods that could also be contaminated by them.
* Use different refrigerators for raw and cooked foods if possible. If only one fridge is available keep the raw foods on the lower shelves with other foods above them.
* If no fridge is available food should be placed in the coolest part of the food

room. It should be kept covered and away from the window, waste bins and

anywhere where cleaning is taking place.

# How do we control equipment-­‐to-­‐food contamination?

To prevent cross contamination, food handlers must:

* Thoroughly and immediately clean work surfaces where raw meat and

poultry have been handled.

* Keep utensils and equipment used in the preparation of raw meats and poultry separate from those used for other foods. If this is not possible, they must be washed and disinfected before being used on other foods.
* Maintain a high standard of general cleanliness of worktops and equipment.

# Controlling food handler-­‐to-­‐food contamination

* Food which has passed its shelf life should never be used or sold
* Raw and high risk food should never be mixed, or the same utensils used for

both products

* Avoid handling unwrapped foods. Tongs, gloves, bags or wrappers should be used when possible
* Never blow into bags to open them. Food or wrapping materials that have been on the floor should never be used
* Do not lick your fingers when handling food or wrapping materials
* Foods should be tasted with a clean spoon. The spoon should be cleaned

before tasting again

* Wash hands frequently throughout the day
* Make sure your equipment and utensils are kept clean
* Damaged and spoiled goods should be kept separate from other goods
* The highest standards of personal hygiene must be maintained at all times

# Keep hot food hot. Keep cold food cold.

When preparing food keep it out of the temperature danger zone. Prepare food as quickly as possible then either cook or refrigerate.

# Destroying Bacteria

Kill pathogenic bacteria with heat by cooking food for the correct time at the right temperature.

Not all food is cooked. In these cases, the only line of defence is to stop contamination.

The majority of food poisoning outbreaks happen because food is prepared too far in advance and then stored at incorrect temperatures.

# Preserved foods

Bacteria find it difficult to grow on preserved foods. Preservation techniques for food can use:

* Drying
* Pickling
* Sugar
* Chemicals
* Salt/brining
* Freezing
* Vacuum packing

These methods help foods be unsuitable for bacteria to grow on and keep food safer for longer. Before preserving foods, heat can destroy the bacteria. Three processes for this are:

* Pasteurisation -­‐ rapid heating to 72°C for at least 15 seconds.
* Sterilization -­‐ 104°C for 40 minutes or 113°C for 15 minutes.
* Ultra-­‐Heat Treatment (UHT) -­‐ 132°C -­‐ 140°C for up to 5 seconds.

# Chemical contamination

Harmful chemicals can be accidently added to food in a variety of ways, for example incorrect storage of cleaning chemicals or residue left over after cleaning due to insufficient rinsing.

# Chemical contaminates could be:

* Pesticides
* Cleaning Chemicals
* Grease
* Fumes
* Agricultural Chemicals
* Pest Baits

The symptoms of chemical poisoning can be similar to those from microbiological hazards, namely vomiting, diarrhoea and abdominal pain. Victims may also experience burning around the mouth or digestive tract.

Other symptoms of chemical poisoning can take months or years to become evident, especially if the consumer is eating a small quantity of the chemical, but on a regular basis.

# Physical contamination

A physical contaminant can be any foreign body present in the food, sharp objects can cause injury and some may harbour pathogens.

Examples of physical contaminants are:

* Stones, pips, leaves or stalks from fruit
* Glass or crockery fragments
* Bone fragments from meat
* Shell fragments from eggs, nuts or shellfish
* Paper, string, staples or plastic from packaging
* Nuts, bolts and screws from machinery
* Dust and dirt from the air, rubbish or unclean equipment

# How can chemical and physical contamination be controlled?

Foods should be bought from reputable suppliers. Regular checks need to be made to ensure physical objects or chemicals are not contaminating foods.

All workplace procedures should be followed such as sieving and washing. Foods should be wrapped / covered at all times. Chemicals should be stored and used safely.

# GOOD HANDLING PRACTICE FROM RECEIPT TO SERVICE

**Why are good handling practices important in controlling food safety?**

Effective hygiene control and the prevention of contamination depend on the food or product being handled with care, right from the delivery of goods through to them being served to the consumer.

Think about all the stages adopted by your workplace and the hygiene controls which are in place. They may include the following areas:

* Suppliers and delivery
* Storage
* Dry goods
* Refrigerated storage / freezer
* Bottled / canned goods
* Vegetable / fruit storage
* Stock rotation
* Correct food preparation
* Cooking and cooling
* Service / sale to the consumer

# Control of suppliers and delivery

**When taking delivery of supplies you should check:**

* The food is of the right quantity and quality and the date marking is correct
* The temperature of frozen goods (if above -­‐12°C should not be accepted)
* The temperature of chilled goods (if above 8°C should not be accepted)
* For any signs of damage
* For any signs of pest infestation
* The appearance of the person delivering the goods

# Storage control

Once the goods have been delivered they should be stored correctly.

# How should dry goods be stored? Dry food storage areas should:

* Be dry
* Be cool
* Be well-­‐ventilated
* Be regularly cleaned and maintained
* Be well-­‐lit
* Be free from pest infestation
* Have shelving up off the floor and away from walls
* Have foods stored in airtight containers

# Control of refrigerated storage

**Refrigeration slows down the multiplication of bacteria but it does not kill bacteria.**

When storing perishables, the these guidelines should be followed:

* If possible, separate fridges should be used for raw and cooked foods. If

using the same fridge then cooked foods should be kept on the higher

shelves, raw foods should be kept on the bottom shelves (so raw meat juices do not drip onto other foods and contaminate them).

* Check the temperature of the fridge regularly and record (ideally it would be 1°C -­‐ 4°C). Opening the fridge door raises the temperature of the fridge -­‐ do not leave the door open for any longer than is absolutely necessary.
* Do not put hot foods directly into the fridge -­‐ it raises the temperature of the fridge, causes condensation and can break the thermostat.
* Do not overload the fridge as air needs to circulate.

# Control of storage in a freezer

Freezing does not kill bacteria, but they are dormant (unable to multiply).

* The freezer should be operating at a maximum temperature of -­‐18°C
* Check the temperature regularly and record
* Label all foods to be able to observe correct stock rotation
* Do not overload above the load line
* Ideally raw and cooked foods should have separate freezers

# Control of bottled & canned goods

If seals are not secure, contamination of the product could have occurred. Cans should be checked. Dented, rusty or blown cans should be discarded. Lids should be secure on bottled goods.

# Control of vegetable & fruit storage

To prevent the spoilage of vegetables and fruit, special storage conditions need to be observed.

They should be:

* Stored in a cool room
* Off the floor
* Used in correct rotation
* Discarded immediately if showing any signs of spoilage
* Vegetables should be stored in the dark and not touching other vegetables

# Control by stock rotation

This is important to make sure that old stock is used up before new; this will reduce the chances of food causing safety problems and having to be thrown out.

Food handlers are responsible for making sure that all food is used in strict date order.

It is a food handler’s responsibility to:

* Move old stock to the front of the fridge where it will be used first.
* Place new stock underneath old stock in freezers.
* Rotate fresh produce by date and condition. Use the ripe fruit first, leaving the less ripe fruit for later.

# Controlling the hazards by preparing foods correctly

Preparing foods correctly means avoiding cross contamination (transferring pathogenic bacteria from raw foods to cooked foods) and observing high standards of personal hygiene at all times.

# Correct Thawing

Some foods may be cooked from frozen, but others must be completely thawed. If food is still frozen, the outside may cook whilst the inside may only reach room temperature. This means that any bacteria present in the food will be able to multiply as they will be within the temperature danger zone (5°C -­‐ 63°C).

# Controlling the hazards by preparing foods correctly

**When Thawing Frozen Food:**

* Place the food in a cool area, well away from any other preparation area
* Avoid cooling cooked foods in the same area as thawing foods to prevent contamination
* Keep thawing foods well away from high risk foods
* Once food is thawed, refrigerate it
* Cook within 24 hours
* Do not refreeze
* Clean and disinfect equipment used
* Completely thaw
* Wash hands

# Temperature control -­‐ Cooking and cooling foods

Correct temperature control is the most powerful weapon against the infection of food by food poisoning bacteria.

# About 80% of food poisoning outbreaks are due to inadequate temperature control.

Foods must be stored safely and at the right temperature to avoid contamination and waste. Storage conditions and the length of time that food can be safely stored depend on the type of food and how it has been preserved. The most important aspect of temperature control is to keep food (especially high risk food) out of the **Temperature Danger Zone.**

# Cooking foods

To kill bacteria, food must be cooked thoroughly (at least 70°C for 2 minutes). Some bacterial spores and some toxins are only destroyed if subjected to higher temperatures for a greater length of time. Ensure all foods are thoroughly cooked before they are served.

# Keeping hot foods hot

High risk foods that are eaten immediately following cooking are safe, providing the cooking temperature has been sufficiently high. If food is not to be eaten immediately and kept hot, it is necessary to use equipment which will hold the food at a temperature of 63°C or above.

# Key points for the use of heated trolleys and cupboards are:

* Heat the equipment to at least 63°C before the food is loaded.
* Ensure the food is fully cooked and at a temperature of at least 63°C when

loaded.

* Never use the equipment to heat up cold or partially heated food.

# Keeping cold foods cold

Many foods that are eaten cold have sufficient nutrients and moisture to enable bacteria to grow quickly. Cold meats and poultry, prepared salads, pates, soft cheeses, sweets and cream are all examples.

The rules for foods that will be eaten cold are:

* Keep under refrigeration until as near as possible to the time of

consumption

* Handle them as little as possible
* Keep away from other foods -­‐ particularly raw foods and keep covered

# Keeping prepared food out of the danger zone

If food is not to be served immediately it should be cooled to less than 8°C within 90 minutes of cooking.

Once cooling is complete it must be refrigerated immediately.

Rapid cooling is essential as when food is cooling it passes through the temperature danger zone. If given time, any bacteria (and spores) that have survived the cooking process will multiply.

# Rapid cooling will be aided by:

* Dividing food into smaller portions
* Cooked foods being transferred into a cold container that is immersed in ice

cold water

* Food being placed in the coolest part of the workplace, i.e. a well ventilated

area, provided it does not carry a risk of contamination

# Reheating of cooked foods

Re-­‐heated cooked foods, especially poultry and meat, are implicated in many cases of food poisoning.

Food handlers will often make the mistake of thinking that the bacteria will have been killed when the food was cooked.

Some bacteria, especially spore forming bacteria, may not have been killed by cooking.

Alternatively, following cooking, the food may have been re-­‐contaminated.

If food that has been contaminated by one of the above methods is only lightly warmed instead of being thoroughly reheated, bacteria will have the ideal conditions for growth.

The following guidelines should be followed:

* Do not remove foods from the fridge too far in advance of them being

reheated

* Handle the food as little as possible, keep it covered and away from other

food

* Divide large items into smaller portions
* Heat the food to at least 70°C at its core
* Serve immediately
* Never reheat cooked food more than once
* If heating a ready meal, follow the manufacturer's instructions

# Service and sale of food to the consumer

When displaying food for sale, it needs to be protected against sources of contamination. All foods must be covered to prevent contamination by either customer or staff.

To prevent customers from contaminating the foods, they should not be able to handle unwrapped foods before they buy them.

# To maintain good hygiene control, food handlers must:

* Use tongs or spoons to pick up food (one for each kind of food).
* Place paper, polythene or a container on scales and weighing machines

before using them.

* Never handle food and money at the same time.
* Make sure animals are kept out of food premises (except guide dogs in

shops).

* Keep foods covered and away from the serving counter to prevent

customers sneezing on them.

# KEEPING THE WORKPLACE CLEAN AND HYGIENIC

Food places must be kept clean and tidy and must be disinfected regularly. It is important to know how to clean everything correctly so that it is safe.

It is vital to remember that even when something looks clean it could be

contaminated with harmful bacteria that we cannot see. Cleaning is not usually

a favourite job but, as we will see in this module, it is an essential one.

# What is cleaning?

Cleaning is the process of removing waste, grease and dirt. This is done in a variety of ways, usually by a combination of:

* Heat -­‐ hot water
* Chemicals -­‐ such as detergent
* Scrubbing -­‐ physical / mechanical effort

# What is disinfection?

Following the removal of the dirt and grease; disinfection takes place. The purpose of disinfection is to reduce the number of bacteria down to a safe level. Surfaces, equipment and premises can be disinfected using either:

* Chemical disinfectants
* Heat -­‐ very hot water (above 82°C) or steam

Cleaning chemicals will destroy enough bacteria to safeguard health, even though they do not kill all pathogenic bacteria and their spores.

# Cleaning is a two stage process:

* Disinfectants must be used after cleaning because disinfectants cannot

remove grease and dirt

* To work properly, disinfectants must be used at the right strength and given

the right 'contact time' with the surface to be disinfected

# Why do we need to clean?

* It reduces the risk of contamination of food by bacteria and foreign bodies
* The chance of attracting pests is reduced
* The law states that all food premises must be kept clean and hygienic at all times
* Our consumers expect their food to have been prepared in clean and hygienic premises

# Types of cleaning

The cleaning of the workplace can be divided into two broad categories:

* Clean as you go
* Scheduled cleaning

# What does 'clean as you go' mean?

It is much easier to keep things clean and tidy as you are working rather than leaving it until later. It applies to cleaning that should be done quickly after soiling occurs. The aim is to prevent cross contamination as well as injury to staff that may slip on spillages.

Examples of this type of cleaning include:

* Washing a chopping board immediately after use
* Cleaning up a floor spillage just after it has happened

# What is scheduled cleaning?

This type of cleaning involves cleaning jobs which are carried out at specified times. The times will vary depending on the item to be cleaned.

The cleaning schedule should show:

* The item or area to be cleaned
* The frequency of cleaning required
* The method of cleaning including chemicals to be used, protective clothing

required and safety precautions

* The staff involved, including the name of the person responsible for

checking that the cleaning has been done properly

Remember to avoid cross contamination. Cleaning is a very important part of any food handler’s work. Cleaning done badly simply spreads bacteria. It is your responsibility.

# Cleaning and disinfection chemicals Detergents

Detergents are chemicals that will dissolve grease and assist in the removal of

food debris and dirt. **Detergents do not kill bacteria.**

# Disinfectants

Disinfectants are chemicals designed to destroy bacteria. They reduce the

number of bacteria to a safe level. Disinfectants are not effective in removing

dirt and grease. Some disinfectants are not suitable for use on food contact

surfaces as their strong smells may taint foods.

# Sterilisers

These chemicals are safe to use in food preparation areas and they reduce food

poisoning bacteria to safe levels.

# Sanitizers

Sanitizers combine the roles of detergent and disinfectant. They are designed

to remove dirt and grease as well as killing bacteria in one operation.

# Rules for using cleaning solutions

* Follow the manufacturer's instructions including those for dilution and storage
* When diluting chemicals, too little will be ineffective, too much will be difficult to rinse off as well as wasteful
* Make up fresh solutions frequently; dirty water makes the chemicals less effective
* Wear protective clothing when necessary
* Do not store chemicals in the food area
* Switch off and isolate any electrical equipment with dry hands before you

start to clean it

* Do not mix chemicals -­‐ they are less effective and can release poisonous

gases

# Cleaning procedures

All workplaces should be left clean, tidy and disinfected at the end of each production period / day. Cleaning should be done from the cleanest to the dirtiest area to avoid contamination. The following should be disinfected frequently:

# Food contact surfaces such as:

* Work surfaces and chopping boards
* Food processing machinery such as slicers, mixers, mincers, knives, tongs and other utensils
* Containers
* Production belts

# Hand contact surfaces such as:

* Fridge, freezer, cupboard and drawer handles
* Taps
* Switches

# Contamination and bacterial multiplication hazards such as:

* Cloths and mops
* Waste bins and their lids

# The stages of cleaning are: Pre-­‐clean

Remove the worst of the dirt, food debris and left over food.

# Main clean

Use clean water and detergent; paying attention to difficult areas such as

corners.

# Rinse

Remove all traces of detergent.

# Disinfection

Use a disinfection solution for the necessary contact time.

# Final rinse

Use clean hot water to remove all traces of disinfectant.

# Drying

Leave to air dry, this prevents contamination with a dirty cloth.

# Dishwashing with a machine

Dishwashers are an effective way of cleaning and disinfecting the equipment used to prepare food. Always follow the manufacturer's instructions and ensure the correct amounts of chemicals are being used.

# What about cleaning equipment?

Mops and cloths should be disinfected immediately after use and left to air dry. Cleaning equipment should not be left to soak in disinfectant for longer than the recommended contact time as bacteria may become resistant to the chemicals.

As an example, if a cloth is left to soak overnight -­‐ once the contact time has elapsed the cloth is left in its own bucket of lukewarm dirty water. A perfect place for bacteria!

# LAYOUT AND DESIGN OF FOOD PREMISES AND EQUIPMENT

The design, construction and maintenance of food premises and equipment are an important part of hygiene control. They can ensure that food is prepared for sale in hygienic conditions and that food stays safe.

Well-­‐designed premises can be an important control measure in preventing food poisoning. The design and layout should assist cleaning and workflow.

All fittings and equipment should be built from suitable materials and used properly. Although as a food handler you may not be responsible for the way the workplace is organised, you do have a responsibility to look after the food areas, utensils and equipment you use.

# How can good layout and design control food safety?

Good design and layout is important because**:**

* The risk of cross contamination is reduced
* It allows easy and effective cleaning and disinfection
* It reduces the risk of infestation by pests
* A pleasant and safe working environment is provided for all staff

# Food premises

Food premises must be suitable for their use and in many countries (including the UK) they must be registered with the local public health authority.

Food premises must be suitable for the kinds of food that will be processed in them. There are a variety of different designs but they will all be constructed following some general principles.

Firstly, the premises should allow staff to control the temperature of food including:

* Ensuring adequate ventilation to stores, food preparation rooms, refrigerators and freezers
* All chilling equipment placed out of direct sunlight

The design of food premises must also prevent contamination by allowing for:

* A safe work flow
* Separation of raw and cooked food
* Separation of clean and dirty activities
* Safe disposal of waste
* Staff to clean easily and thoroughly
* Good personal hygiene
* Measures to prevent pest infestation e.g. window screens, door strip curtains

# What should food premises be made of?

The most suitable materials for the construction of food premises are:

* Durable
* Impervious
* Smooth
* Light coloured (so dirt can be seen)
* Easy to clean
* Heat resistant

Matters of Health & Safety also need to be considered e.g. floors should be non-­‐slip.

# What is workflow?

The idea of a good workflow is to safeguard the food from the risk of contamination. It is important for food handlers to plan ahead and ensure a good workflow is followed. A key objective is to separate clean from dirty areas of operation.

A good workflow involves:

* Well-­‐planned routes through the food area for the food and food handler.

Initial food preparation should be as near to the storage area as possible,

with the final work being carried out nearer the area for packaging, sale or

service

* Separating raw and cooked food
* Keeping clean and dirty activities separated
* Ideally having storage areas near delivery areas so that deliveries are not

carried through food preparation areas

# Design of premises to control food safety

Things to consider when designing food premises to control food safety:

# Work Surfaces

* Smooth with no cracks or joints
* Non-­‐absorbent / easy to clean
* Could include stainless steel, ceramics and food grade plastics

# Floors

* Easy to clean
* Non-­‐slip
* Tiled floors as even as possible
* Constructed so water can drain away

# Walls & Ceilings

* Impervious (unable to absorb)
* Smooth walls (not flaking)
* Smooth ceilings
* Fire resistant ceilings
* No joints or cracks for bacteria to collect in

If you become aware of any worn or damaged floors, walls, working surfaces etc., report them. Things to consider when designing food premises to control food safety:

# Shelving

* Easy to clean
* Firmly fixed
* Bottom shelves not on the floor
* Doors
* Capable of being disinfected
* Smooth non-­‐absorbent surface

# Toilets & Washing Facilities

* They must not lead directly into food rooms
* A "now wash your hands" notice should be posted nearby
* They should be equipped with soap, towels etc.

# Design of equipment to control food safety

It is your responsibility to check equipment before you use it. If you notice any signs of damage you should report the fault immediately. To control food safety, equipment should be:

* Easy to clean
* Smooth
* Well maintained
* Non-­‐absorbent
* Made of a non-­‐toxic material
* Resistant to rusting
* Durable e.g. stainless steel
* Tableware should be non-­‐porous and free of chips and cracks that could

harbour bacteria

* Colour coded equipment may be used

# FIRST AID

**The law requires that the employer must provide a properly stocked first aid box.**

First aid kits should contain items such as:

* Brightly coloured waterproof plasters
* At least one pair of disposable gloves
* Sterile, individually wrapped, non-­‐medicated wound dressings
* Sterile eye pads
* Individually wrapped triangular bandages (preferably sterile)
* Safety pins
* A guidance card on first aid

# RUBBISH DISPOSAL

Food waste and packaging rubbish must be disposed of properly as it can be a source of both bacterial and physical contamination. Food waste can also attract pests.

There should be bins both inside and outside. Indoor bins need to be within easy reach of the food handler (but not so close as to create a contamination risk). Indoor bins should have lids and ideally be foot operated and lined with a disposable polythene sack.

Rubbish should be removed throughout the day to a dustbin with a tight fitting lid or a skip with a lid. The bins, lids and area around them should be kept clean and tidy at all times to prevent the risk of contamination or attracting pests.

Always wash your hands after handling rubbish and waste food!

# Pest control

Pests can present a lot of risks to businesses, so it is important that to be aware of the hazards they cause and how to control them.

A food pest lives in or on our food and can contaminate our food. They will be attracted to places where food is stored, prepared, sold, served or thrown away in their quest to find food, warmth and shelter. There are many ways in which they can enter buildings, including through open windows and doors, cracks in brickwork or pipework.

Many pests live in unhealthy places where they pick up pathogenic bacteria on their bodies and legs. Some pests also have pathogenic bacteria living inside their bodies, which can spread to food through their droppings or saliva as they feed.

Pests can also spread food borne diseases such as dysentery.

Physical contamination can also be caused by pests in the following ways:

* Droppings
* Eggs
* Fur
* Nest material
* Mites
* Parasites
* Moults (the outer shell)
* Dead bodies

# Pest control -­‐ Common food pests Rodents -­‐ rats and mice

* Rodents carry harmful bacteria in their faeces and urine
* Mice have weak bladders and "nibble and dribble" at the same time
* A mouse can fit through a hole the size of a pencil
* Rats like familiar territory. As they travel the same route, they leave greasy

smears along the bottom of walls due to contact with their dirty fur

* Both rats and mice gnaw constantly and can cause considerable damage to

property and food stock

* They have even been known to cause explosions and fires by gnawing

through electric cables

# Insects -­‐ flies, cockroaches, ants...

* Cockroaches are nocturnal (they come out at night) and live in large groups
* Cockroaches have been found to harbour over 40 different types of harmful

bacteria on their bodies

* Flies live and breed on rubbish, animal droppings and human food. As they

are unable to eat solid food, they first vomit on the food then suck the food

back up

# Birds -­‐ pigeons, sparrows, starlings...

* Birds all carry harmful bacteria in their droppings
* They can cause damage by building nests. Nest material can also cause

physical contamination

# Pets -­‐ dogs, cats, hamsters...

* Also capable of contaminating food if allowed into food preparation areas

# Pest control -­‐ Why do we need to control pests?

Pests need to be controlled to:

* Prevent the spread of disease -­‐ rodents, flies, cockroaches and birds are all

capable of spreading disease

* Prevent damage -­‐ every year thousands of pounds of damage is caused to

the structure and fabric of buildings by pests

* Reduce wastage of food -­‐ contamination of food by pests leads to

complaints and is the main reason for the destruction of large quantities of

food products

* Comply with the law -­‐ the law requires premises to be kept free from pest

infestation

# Pest control -­‐ How can we tell if there is a problem?

If pests have entered food premises there are normally signs of their presence. Look out for the following hazards:

* The creatures themselves
* Holes or nesting sites
* Droppings, egg casings or foot prints
* Hairs, smears and rat runs
* Moults -­‐ cockroaches shed their skins as they grow
* Signs of damage -­‐ gnaw marks, pecked milk tops etc.
* Scratching, pecking or gnawing sounds
* Physical contamination of food products
* Unusual smells, pest carcases

You must dispose of any food you suspect may have been contaminated by pests.

# Pest control -­‐ How can we control the hazards?

Efficient pest control involves protecting the food premises. Pests seek food, warmth and shelter. To prevent the risk of infestation, it is your responsibility as a food handler to:

* Never leave items of food uncovered or exposed for long periods
* Store food off the floor in appropriate containers
* Check deliveries for signs of infestation and never leave food outside
* Adopt good housekeeping habits. Clean as you go
* Make sure kitchen waste is not left uncovered in the outside bin
* Check stored food regularly and follow stock rotation rules
* Put rubbish in bins with secure lids
* Keep door and window screens closed
* Check the maintenance of the building to prevent pest entry
* If a pest is seen it must be reported

# Pest control -­‐ Who can help us control pests?

Many businesses will use a specialist contractor. They will have sufficient knowledge of the pest’s life cycle or habits to ensure rapid and safe control. The contractor may provide:

* Insect electrocutors to control flies and other flying insects. The trays at the bottom of the machine need emptying occasionally
* Poison baits -­‐ small boxes that contain certain poisons to control rodents
* Screens on doors and windows designed to stop flying insects entering the

area. In order to stop flying insects these must not be damaged or left open

* Remember -­‐ you must not interfere with anything supplied by a specialist

pest control contractor