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ROYAL SOCIETY FOR PUBLIC HEALTH

VISION, VOICE AND PRACTICE

Level 2 Award in Food Safety

Welcome !

Learning Objectives

- Understand Food Safety Hazards
- Understand How to Control Food Safety Hazards

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Session one

- The importance of food safety
- The symptoms of food poisoning
- Groups most “at risk’ of food poisoning
- Categories of food safety hazards

Activity……

- List the possible consequences of a food business having poor standards of food safety or food hygiene ……..

The cost of poor food safety and food hygiene

- Illness and sometimes death of consumers
- Customer complaints
- Pest infestations
- Food Waste
- Product recall
- Loss of reputation
- Lower profits
- Closure of the business
- Fines and imprisonment

What is food hygiene?

All conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.

What is food safety?

Assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.

Common symptoms of food poisoning

- Nausea
- Vomiting
- Diarrhoea
- Stomach pain
- Dehydration

Who is most "at risk"?

- Infants
- Pregnant women
- Elderly people
- People with weakened immunity

Contamination of food – the hazards

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Microbiological

Bacteria and their toxins, viruses, moulds, yeasts

Chemical

Examples: bleach, insecticide, poisonous plants, poisonous toadstools

Physical

Examples: bone fragments, glass, stones, hair

Allergenic

Some people are very sensitive to certain foods (eg peanuts, tree nuts, milk, eggs)

Chemical hazards

Examples

Bleach, insecticide, poisonous plants, poisonous toadstools

Effect on consumer

Unpleasant food taste, stomach irritation, poisoning, corrosive burns and death

Some Controls:

- Use approved suppliers of food
- Store cleaning chemicals away from food
- Follow recommended cleaning instructions
- Follow expert pest control advice

Physical hazards

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Sources:

Natural – shell, feather, bone, stalks, stones

Food Handler – false nails, jewellery, hair, button, pen top, plaster

Equipment – nuts, bolts, screws, wood, foil

Premises – wall pins, light fittings, glass, paint flakes, packaging material

Pests – droppings, larvae, eggs, insects, fur, feathers, dead bodies

Effects on consumer:

Choking, cuts to mouth, broken teeth

Physical hazards

Some Controls:

- Keep food covered
- Follow cleaning and housekeeping rules
- Follow food handler uniform and hygiene policies
- Effective pest control
- Maintenance of buildings and equipment
- Detection of physical hazards in food manufacturing lines

Allergenic hazards

Sources:

- Almost any food can be an allergen to susceptible people
- 14 “regulated” allergens are the most common, including peanuts, tree nuts, milk and eggs

Symptoms in susceptible people:

- Difficulty in swallowing, flushing of skin / rashes, nausea, collapse and death

Allergenic hazards

Examples of controls:

- Avoid “cross contact” between food items
- Effective cleaning procedures and hand washing
- Identify all the allergens in food dishes (remember to include: garnishes, sauces, toppings, marinades)
- Clear labelling of food items to highlight the allergens
- Provide accurate allergen information to customers
- Follow your organisation’s rules about control of allergens and communication to consumers

Never Guess about whether a dish contains an allergen!

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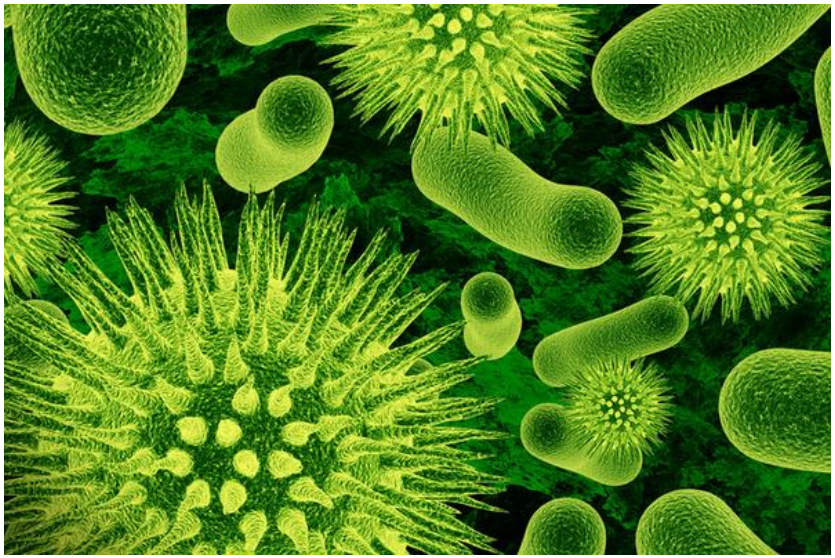
Session two

- Growth requirements for bacteria
- Examples of “High-Risk” foods
- The temperature “Danger Zone”
- Signs of Food Spoilage
- Bacterial toxins and spores
- People as sources of pathogenic bacteria

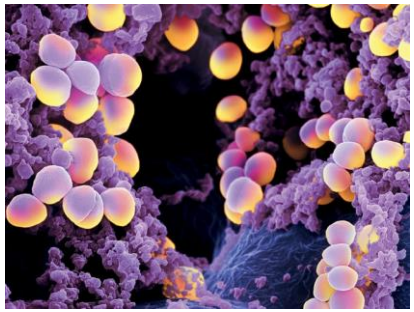
Bacteria

- Bacteria are everywhere !
- Good bacteria (eg in cheese and yogurts)
- Harmful bacteria – “Pathogens”
- Bacteria can be one cause of food spoilage

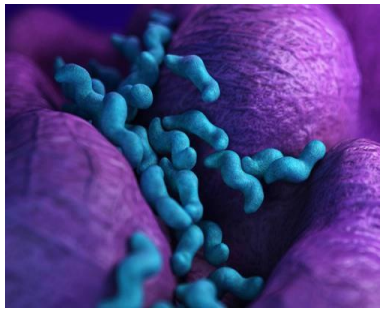


Food Poisoning Bacteria As Seen Through a Microscope

Clostridium Perfringens

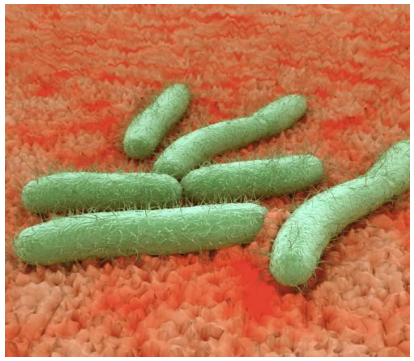


Staphylococcus aureus



Campylobacter

Salmonella



Escherichia coli

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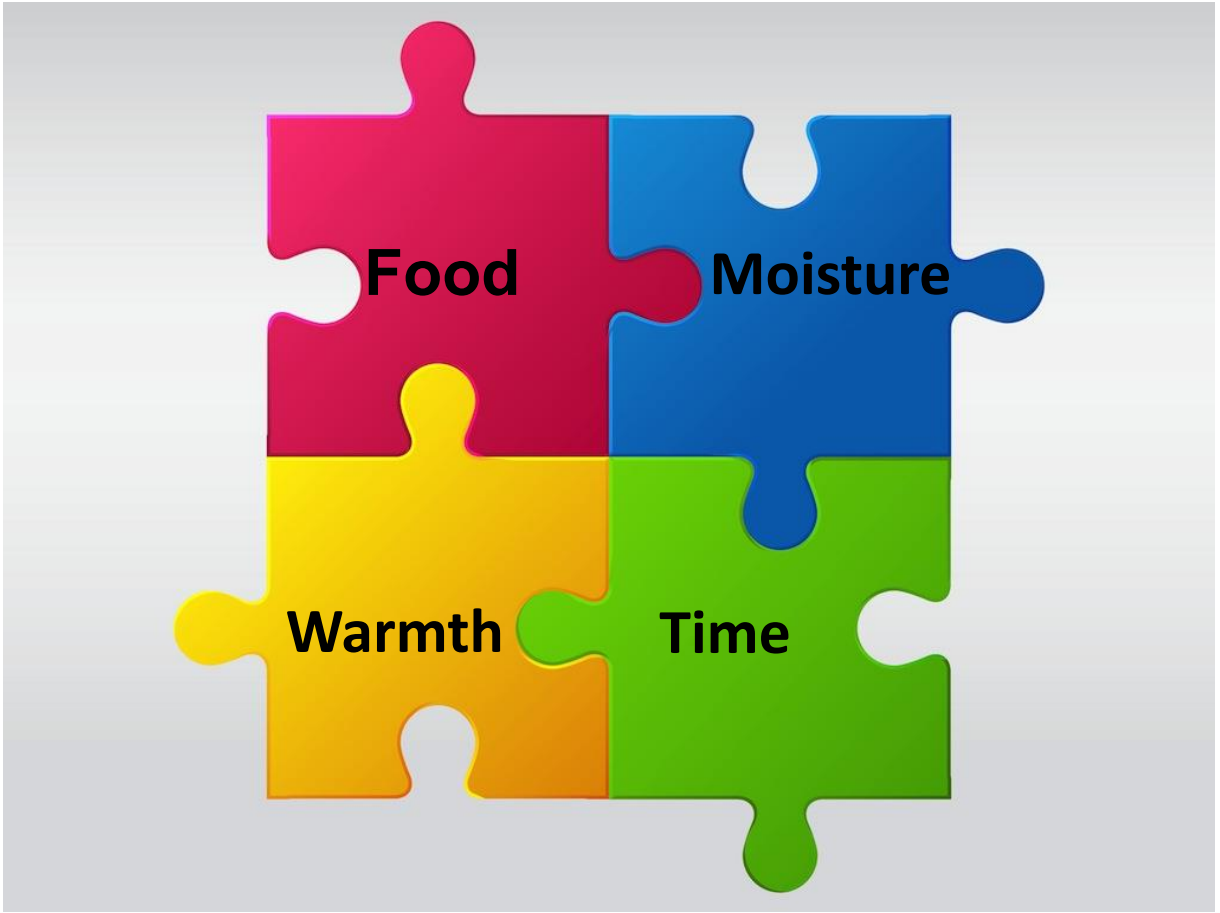
Is this food safe to eat?

Conditions for Bacterial Growth



High Risk Foods

Cooked meat and poultry; cooked meat products; gravy, soup and stock

Milk and eggs, and dishes made from them

Cooked / prepared Shellfish & Seafoods

Cooked rice

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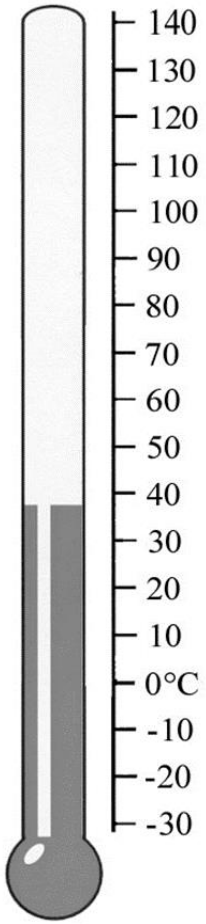
Safe usage of eggs…..

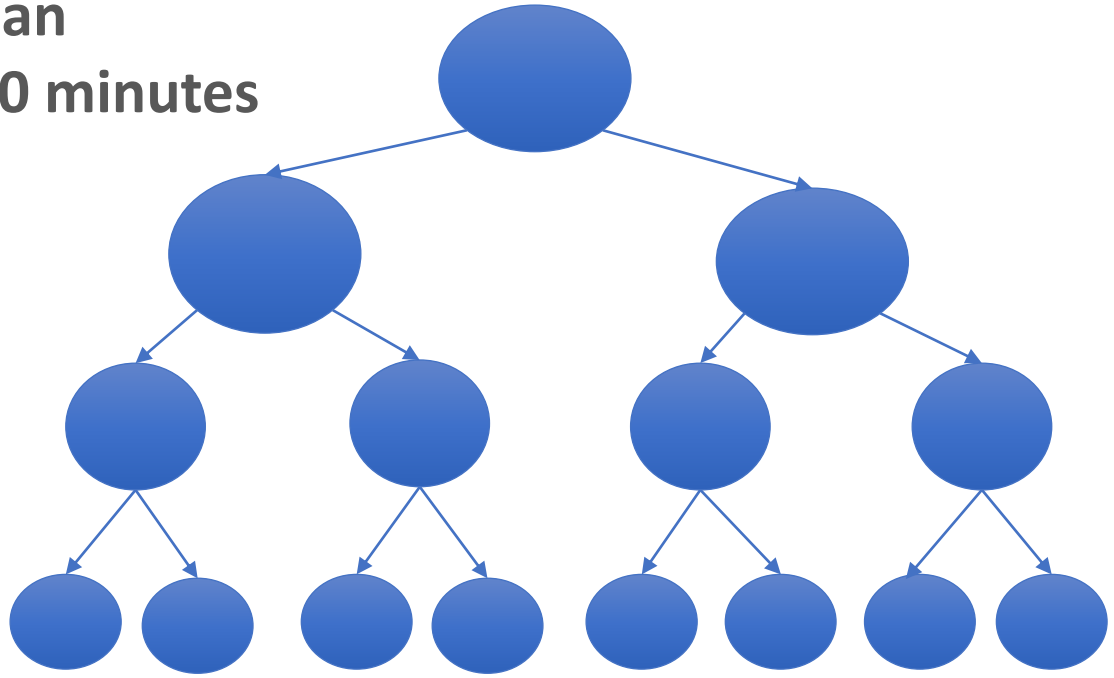
Temperatures and Bacterial Growth



- 121 °C to 130 °C Spores killed
- Cooking 75 °C
- DANGER ZONE 5°C to 63°C
- Body Temperature 37 °C
- Room temperature 17 °C to 20 °C
- Refrigerator 1 °C to 4 °C
- Freezer - 18 °C

Binary Fission

Under the right conditions, each bacterial cell can multiply every 10-20 minutes



Food Spoilage

- Food changes include changes in :-
  - Smell
  - Appearance
  - Colour
  - Taste

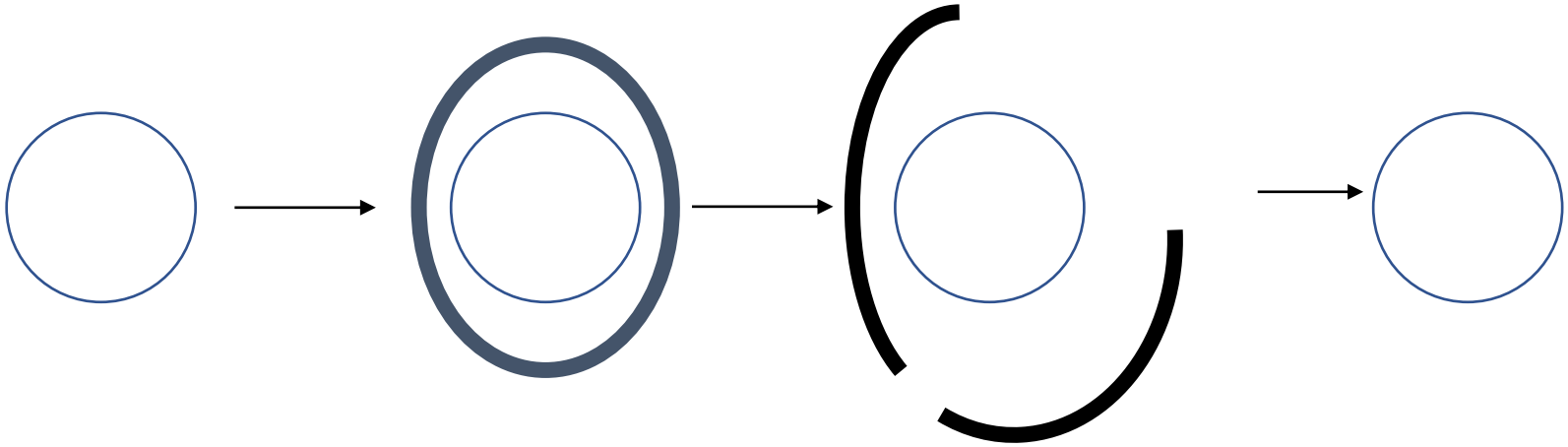
- Gas can be produced (eg “blown” cans)

Spoilt food is unfit to eat and should not be sold !

Ways some bacteria cause food poisoning.

- Bacteria which grow to large numbers on the food we eat. Example *Salmonella* species
- Bacteria present in relatively small numbers on food we eat but which multiply in the intestine. Example *Campylobacter*
- Bacteria that release toxins (poisons). Some toxins are heat resistant. Example *Staphylococcus aureus*
- Some bacteria produce spores that are difficult to kill. Examples *Clostridium perfringens* and *Bacillus cereus*

Bacterial Spores



Bacterial cell

Spore forms when conditions are poor

Spore “germinates” when conditions improve

Bacterial cell released

Bacterial Spores

- Formed by some bacteria in response to adverse conditions, such as heat.
- The bacterial cell forms a hard outer coat or shell for protection.
- Spore does not reproduce in this state, but can survive conditions such dehydration, disinfection or normal cooking processes.
- Virtually all spores are killed in the canning process reaching 121°C for a specified time
- When external conditions improve, spore “germinates” and bacterial cell is released.
- Spores can germinate in food during long, slow cooking at low temperatures.

Sources of Food Poisoning Bacteria

Pests

Raw meat, poultry, eggs and shellfish

Waste food and dirt

Soiled fruit and vegetables

Food handlers

Ways in which YOU can contaminate food

Smoking

Eating while Preparing food

Biting Fingernails

Coughing

Not washing hands after using the toilet

Sores

Tasting food with fingers

Activity……

- List the four main growth requirements for pathogenic bacteria……..

Session Three

- Control of contamination and cross-contamination by microbiological food safety hazards
- “Vehicles” and “routes” for cross-contamination
- Personal hygiene rules, including hand washing
- Protective clothing
- Reporting requirements
- Responsibilities of the food handler / operator

Cross contamination

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The transfer of harmful bacteria from a source (often raw food) to clean or "ready-to-eat" food.

How ?

- Foods touching each other
- Bacteria transferred onto clean or "ready-to-eat" food

Source → Vehicle → Clean or "ready-to-eat" food

Examples of Vehicles:-

- Hands, cloths, utensils, equipment, hand contact surfaces, food contact surfaces

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Avoiding Food-to-Food Contamination

- Keep food covered as much as possible
- Store raw foods in separate refrigerators. If one refrigerator is used, store raw foods below ready to eat foods.
- Separate raw foods and ready-to-eat foods at all stages
- Report and segregate food with damaged packaging

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Avoiding Equipment-to-Food Contamination

- Effective cleaning and disinfection of food contact surfaces, hand contact surfaces, equipment, utensils and work surfaces
- Use of colour coded equipment and cloths when available
- Wash fruit and vegetables in separate sinks to hand washing facilities
- Use separate equipment for raw food whenever possible
- Thoroughly clean and disinfect any “dual use” equipment after every use.
- Keep washing cloths and washing equipment clean
- Use disposable wiping cloths if available

Avoiding Food Handler–to-Food Contamination

- Handle food with bare hands as little as possible
- Use of tongs when possible
- Hand washing prior to every task
- If gloves are worn in the kitchen, they need to be changed as often as you would need to wash your hands
- Have a high standards of personal hygiene when working with food
- Use cutlery once for tasting food, then wash it before using again.
- Effective staff training and supervision

Always wash your hands:-

- Before handling food
- After using the toilet
- After handling raw foods
- After cleaning
- After handling rubbish
- After blowing your nose, coughing or sneezing
- After a break
- And when they look dirty!

Hand washing facilities

- Dedicated hand washbasins
- Hot and cold (or appropriately mixed) water
- Soap
- Materials / equipment for hygienically drying hands

Personal Hygiene

- Nails should be kept clean and short
- No nail varnish or false nails
- Do not wear jewellery (with the exception of a plain wedding ring when allowed)
- Keep hair covered
- Cover any minor wounds with a water- proof easily detectable plaster.
- Report any sores or wounds to your supervisor.

Food handler bad habits!

- X Coughing or sneezing over food
- X Using fingers to taste food
- X Blowing into bags to open them
- X Using the same spoon to taste foods
- X Touching face, hair, ears, etc.
- X Biting nails or fingers
- X Chewing gum, eating or drinking in food areas

IT IS ILLEGAL TO SMOKE IN THE FOOD AREA !

Protective clothing

- Cover all of the food handler's own clothes
- Cover hair
- No external pockets
- Not to be worn outside food business
- Suitable shoes
- Keep clothing clean

Food Handler's responsibilities

- Keep high standards of personal hygiene
- Wear suitable clean protective clothing
- Report to supervisor any rashes, skin conditions, sores or skin wounds
- It is illegal to smoke in food areas
- Report to supervisor if you or a family member have experienced nausea, vomiting, diarrhoea or stomach pains

Activity……

- List six occasions when hand must be washed during your working day as a food handler or food operator……..

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Session Four

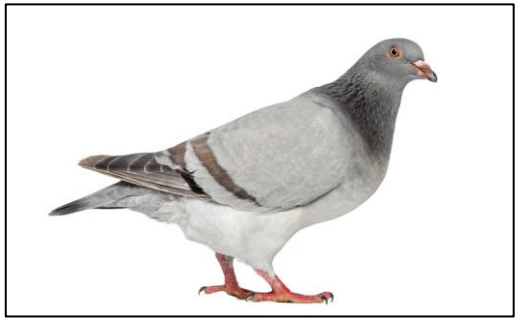
- Examples of food pests
- Signs of pests in the workplace
- 3 point strategy for pest control
- Reporting requirements

Common Food Pests

Rodents

Flies

Cockroaches



Birds

Domestic Pets

Problems cause by pests

Pests contaminate food and surfaces via:

- faeces & urine
- saliva
- contact with their bodies (fur, feet)
- physical contamination (eg dead insects)

Other issues:

- damage by gnawing
- food wastage
- legal penalties
- poor image to customers

Signs of pests

- Seeing live animals
- Droppings or feathers
- Grease trails at the base of walls
- Gnawed packaging or woodwork
- Marks on food
- Dead bodies of pests
- Unusual smells or noises

Tell your supervisor !

Pest Control: Three Point Strategy

- Preventing access
- Denying pests favourable conditions (Food, water, shelter)
- Reporting signs of pests

Pest Control: Preventing Access

- Well designed and maintained premises
- Keep doors and windows closed
- Use fly screens on windows and doors
- Sealing off any access points
- Check deliveries for pests
- Do not let pets onto the premises

Denying Pests Favourable Conditions

- Clean-as-you-go and clean up food spillages
- Keep utensils and equipment clean
- Keep all food covered
- Do not leave food out overnight
- Store food off the floor in pest-proof containers
- Regularly check food storage areas for signs of pests
- Regularly remove waste food and rubbish
- Ensure waste bins have fitted lids
- Keep areas outside premises clean and tidy

Activity……

- List five examples of common food pests…
- List three ways to deny pests access to food areas……..

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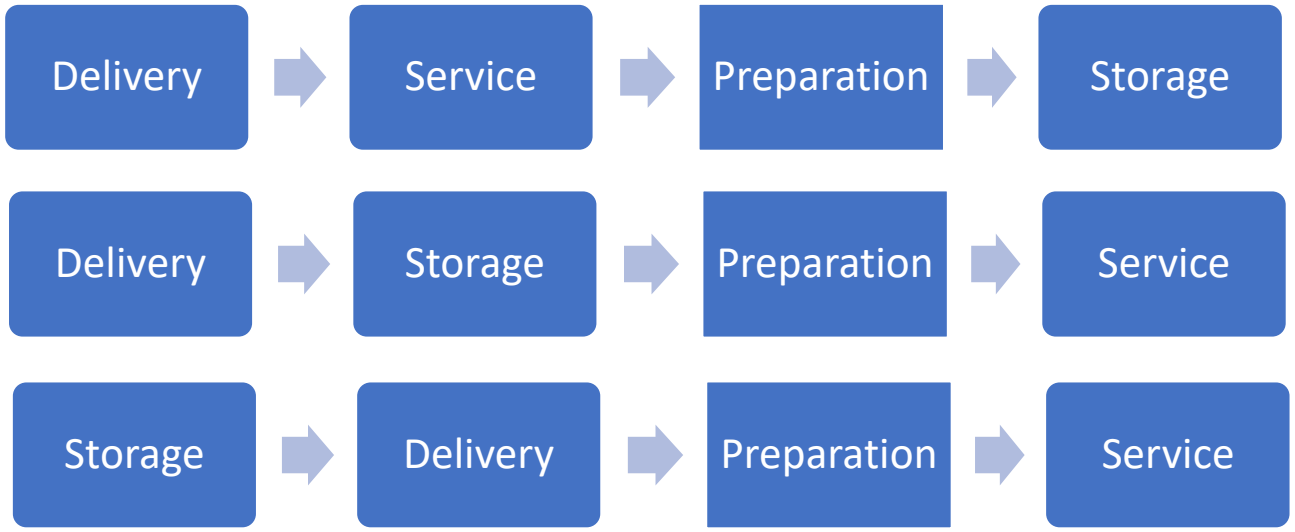
Session Five

- Hygienic layout which reflects the Workflow in the workplace
- The importance of well maintained premises, facilities and equipment
- Hygienic features of floors, walls, fixtures and fittings
- Ensuring safe waste disposal

Workflow in a kitchen

Which is the correct order for workflow?



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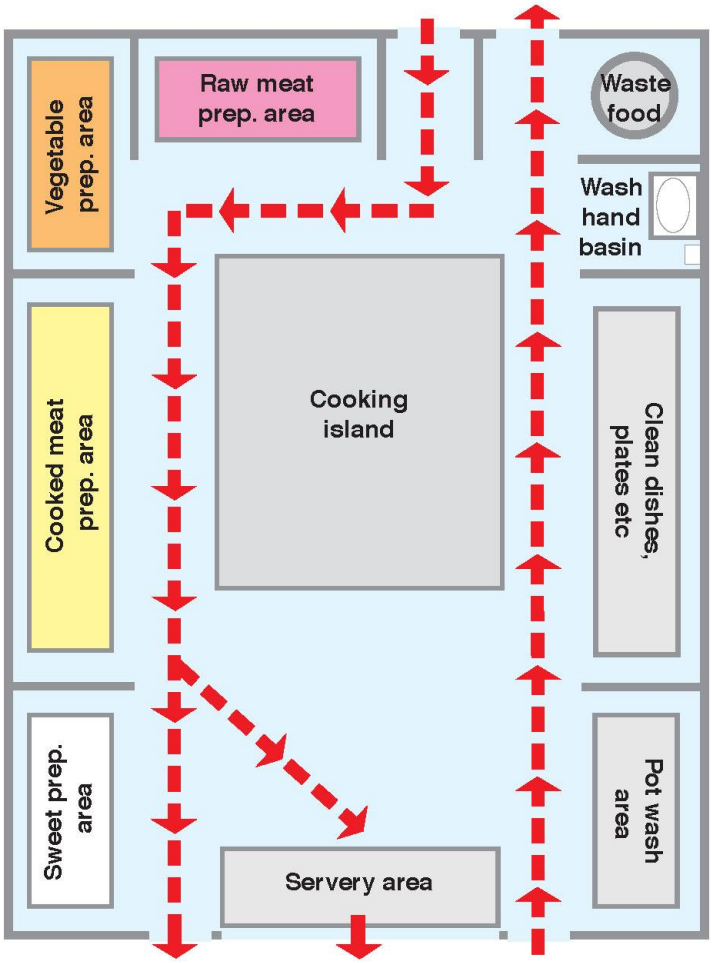
Example of the Layout of a Hygienic Catering Kitchen



Features of floors, walls, fixtures and fittings

- In good condition
- Well maintained
- Easy to clean
- Non-slip floors
- Light coloured walls and ceiling
- Good lighting and ventilation

Facilities continued….

- Plenty of space to work
- Worksurfaces of suitable materials (eg stainless steel, hard plastics)
- Waste bins with covers
- Facilities for cleaning and disinfection
- Toilets
- Hand wash basins

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Session Six

- The important temperatures for the control of food safety
- Keeping ready to eat food out of the “Danger Zone”
- Cooling, reheating and thawing rules for food
- Safe conditions for storage of food
- Checking deliveries and recording the information
- Labels and date marking of foods
- Monitoring and recording of temperatures
- Report, segregate and dispose of unfit food

Significant Temperatures

- 121ºC to 130ºC temperature to kill most spores
- 82ºC - temperature for cooking and reheated foods in Scotland
- At least 75ºC for 30 seconds (or 70ºC for 2 minutes) to ensure thorough cooking of food
- 63ºC - minimum temperature at which cooked foods must be kept hot until serving
- 37ºC - temperature at which most bacteria can grow very quickly
- 5 to 63ºC - Temperature Danger Zone
- 1 to 4ºC - temperature range for a refrigerator
- -18 – freezer temperature

Cooling Food

A general rule is that hot food should be cooled from 55°C to 20°C within two hours of cooking by means of:

- **dividing hot food into smaller portions to speed up cooling**
- **placing hot food containers in an ice bath or cold water vessel**
- **running cold water over an (enclosed) hot food container**
- **using shallow containers**
- **spreading cooling food in a thin layer**
- **using a blast chiller**

Reheating Food

- Keep food refrigerated until you reheat it
- Handle as little as possible
- Divide into small portions
- Heat thoroughly to a high core temperature –
- 75^{o}C for 30 seconds or 70^{o}C for 2 minutes (Heat to 82^{o}C in Scotland)
- Serve immediately
- Only reheat once

Is Your Fridge Safe?

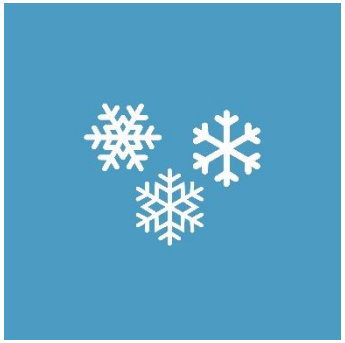
- Store raw and cooked foods separately
- No hot food in the fridge - cool it quickly
- Cover all food; don't overload the fridge
- Check the temperature is 1^{o}C to 4^{o}C
- Keep the door closed as much as possible
- Keep the fridge clean

Freezing

- At least -18^{o}C
- Keep foods covered, do not overfill, use food within their shelf-life

Thawing / defrosting

- Thaw in refrigerator or cold room
- Place the frozen food in a container
- Cover thawing food
- Avoid cross-contamination from thawing food
- Thaw completely and cook as soon as possible
- Once thawed, never refreeze



Dry (“Ambient”) Stores

- Check deliveries on arrival
- Storage areas should be cool, dry, clean and well ventilated
- Store foods on shelving, off the floor
- Keep foods covered
- Do not use damaged tins
- Rotate stock: “First in, First out”
- Report, segregate and dispose of any unfit food

Information on Food Labels

- **“Use By” date – For high-risk / perishable foods**
  Food must be used by this date.
  It is an offence to sell food after this date.

- **“Best Before” date - Foods with a longer shelf life such as canned or dried foods**
  Food quality is affected beyond this date.

Other food safety information on labels:-

- **Allergen information**
- **Storage conditions before and after opening**
- **Traceability information**

Activity……

- List three examples of foods which have a “use by” date and three examples of foods which have a “best before” date……..

Session Seven

- Cleaning and disinfection
- The role of detergents, disinfectants and sanitisers
- “Clean as you go”, scheduled cleaning, cleaning in place, cleaning out of place
- Stages in cleaning and disinfection
- Waste management

Cleaning and Disinfection

- **Cleaning**

  Remove grease, food residues and dirt.

- **Disinfection**

  Reduce micro-organisms to safe levels.

Cleaning and Disinfection Chemicals

- **Detergents**
  Remove grease, food residues and dirt.

- **Disinfectants**
  Reduce micro-organisms to safe levels.

- **Sanitisers**
  Clean and disinfect.

Rules for Cleaning and Disinfecting

- Wear protective clothing
- Use fresh, hot solutions
- Store chemicals safely, away from food area
- NEVER mix chemicals
- Always follow the manufacturer's instructions (eg contact time, dilution rates)
- Keep chemicals in their original containers
- Keep cleaning equipment clean and in good condition

Cleaning and Disinfection

"Clean as you go"

Scheduled cleaning

Cleaning in place

Cleaning out of place

2 Stage Cleaning and Disinfection

Pre-clean - Remove debris and loose material

↓

Main Clean - Hot water and detergent

↓

Rinse - Remove detergent and loose material

↓

Disinfection - Destroy microbiological with disinfectant (contact time may be required) or heat

↓

Final rinse - Remove disinfectant

↓

Drying - For example air drying

Waste Materials

Examples:-

- Spoilt / unfit food
- Packaging
- Paper, foil
- General rubbish

Hazards

- Potential contamination of food destined for consumers
- Attracts pests
- Unpleasant odours
- Build up of waste makes the workplace unsafe and difficult to clean

Waste Management

- Waste / unfit food must be kept separate from other waste material and separate from food intended for consumption
- All bins should have close-fitting lids
- Waste food and other waste material must be regularly removed from the food area
- Cleaning of bins should be included in a cleaning schedule
- External bins should be sited away from the food processing areas

Session Eight

- The purpose of Food Safety Management Systems
- Introduction to HACCP
- Introduction to food law and legal responsibilities
- Enforcement of food laws
- Powers of enforcement officers
- Legal penalties

Food Safety Management Systems

Purpose

- Identifying the hazards that can occur in the food business and prevent them from happening
- Help ensure food is produced which is safe to eat.

Legal responsibility

- Food businesses must implement "a documented food safety management system based on HACCP principles".

HACCP

Hazard

Analysis

Critical

Control

Point

HACCP

- Identify the potential hazards (biological, physical, chemical, allergenic)
- Put in place controls to minimize the risks from the hazards
- Monitoring / recording / reporting

Prerequisites for HACCP

Examples:-

- **Trained and supervised staff**
- **Well designed and maintained premises and equipment**
- **Cleaning schedules**
- **Pest management**
- **Approved suppliers**
- **Effective waste management**
- **Labelling, traceability and product recall procedures**

Food safety legislation

- The Food Safety Act 1990
- The Food Safety and Hygiene (England) Regulations 2013
- The Food Hygiene Regulations (Northern Ireland) 2006
- The Food Hygiene Regulations (Scotland) 2006
- The Food Hygiene Regulations (Wales) 2006
- The Food Information Regulations (2014)
- Temperature controls
- Enforcement

Legal Responsibilities of Food Handlers

Legally food handlers must:

- **Avoid exposing food to the risk of contamination**
- **Report if suffering upset stomachs, colds or coughs**
- **Keep cuts covered with suitable waterproof dressings**
- **Not smoke or spit in the food area**
- **Keep themselves and their protective clothing clean**

Legal Responsibilities of Food Business

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Proprietors and owners must ensure that premises are:

- **Registered with the local authority**
- **Kept sanitary and properly maintained**
- **Adequately supplied with clean water**
- **Well lit and well ventilated**
- **Supplied with suitable facilities for personal hygiene**
- **Provided with suitable facilities for washing utensils, equipment and food**
- **Adequately controlled regarding pests**

Some other Legal Responsibilities:-

- It is an offence to sell food after a ‘use by’ date
- All food businesses must have a documented food safety management system based on HACCP principles
- Food handlers must receive training, instruction or supervision to a level appropriate to their job
- Legislation relating to temperature control and food storage

Legislation Relating to Food Allergens

- General requirement to protect consumers from harm
- 14 “regulated” allergens must be highlighted on food labels
- Provide allergen information to customers (eg on menus or websites)

Enforcing the Law

Powers of Enforcement Officers:-

- Enter food premises at any reasonable time
- Take photographs and samples
- Investigate complaints or food poisoning outbreaks
- Serve Hygiene Improvement Notices
- Serve Hygiene Emergency Prohibition Notices / Close food premises
- Instigate legal proceedings

Legal Penalties :-

- Fines and /or imprisonment for breaking the law

Further guidance and information:

- FSA, Industry Guides

Activity……

- List three legal responsibilities of food handlers……..
- List three legal responsibilities of the food business owner…….

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Good Luck in your Exam!