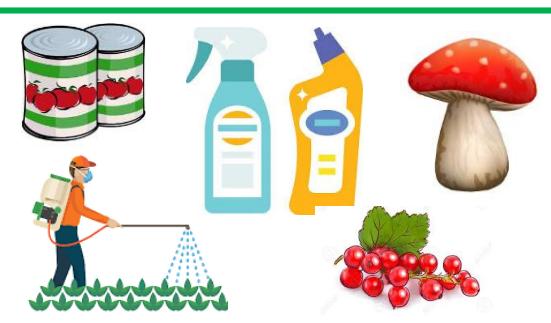


Causes of food illness can be split into 3 categories:  
 1. **Microbes** – tiny microorganisms which can contaminate & spoil food  
 - *Bacteria* - - *Yeast* - - *Mould*  
 2. **Chemicals, metals & poisonous plants**  
 3. **Allergies & intolerances**



**2. Chemicals, metal & plants**  
 - **Chemicals:** can be poisonous - cleaning products, bleach, fertilisers & pesticides in crops/farming, overuse of additives.  
 - **Metal:** aluminium & tin can leach out of pans & tins when reacting with acidic food such as tomato, producing a metallic taste. Leftover food in tins should be transferred into a different container - not stored in the tin (e.g. half a tin of beans)  
 - **Plants:** some plants can be poisoning e.g. some mushrooms, berries, rhubarb leaves



**1. Microbes**  
**Bacteria:** Can be good, or pathogenic & cause food poisoning.  
**Yeast:** used a lot in the food industry in bread & beer making. It is a fungi which reproduced by budding. It needs warm, acidic, sweet foods (it ferments sugars) so can spoil sweet foods such as orange juice.  
**Mould:** used in cheese making. A fungi with thread like filaments which spread into a food (they stay even when the visible mould is cut off). It needs warm, moist conditions and can spoil foods.

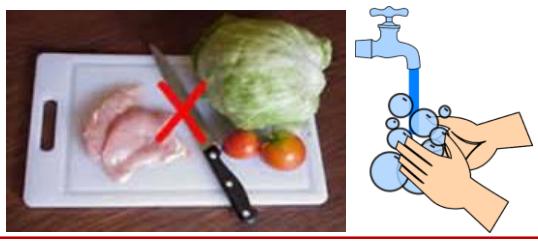


Conditions needed for bacteria to multiply:  
**Moisture** - dried food has a longer shelf life  
**Time** - multiplies every 20 mins(binary fission)  
**Warmth** - multiply in warm conditions  
**Food** (high risk) – high in protein  
 i.e. eggs, meat, fish.  
 \*Use weekdays to help remember(MTWF)

**5-63°C** - The danger zone. Bacteria multiplies rapidly as it has warmth. High risk food should not be kept in the danger zone – you should only take food out of the fridge when ready to prepare it.  
**0-5°C** - Fridge temperature. This slows bacteria from multiplying as they do not get the warmth but does not completely stop or kill it.  
**-18°C** - Freezer temperature. This stops bacteria from multiplying as they do not get the warmth or moisture but does not completely kill it.  
**75°C+** - This kills bacteria. The core temperature of high-risk food such as meat should be cooked to at least 75°C, checked using a food probe  
**63°C+** - 'Hot hold' temperature. Cooked or reheated food must stay above 63° C (out of the danger zone) e.g. in buffets, deliveries. Checks should be carried out every 2 hours to ensure hot food maintains 63°C+



**Cross contamination:**  
 When bacteria is transferred from one place to another - avoid!  
 e.g. *handling raw meat then touching ready to eat food such as salad;*  
*handling raw meat then touching equipment/door handle;*  
*sneezing into food and not washing hands after;*  
*using equipment for raw meat then ready to eat food;*  
*by storing raw and ready to eat foods together in a fridge*



**Prevention during storage**

- Chill cooked foods within 90 minutes
- Check and log temperatures regularly
- Wrap high-risk food & store on correct shelves of fridge
- Only take out the amount required for cooking
- FIFO rotation of foods (old stock to front, new to the back)
- Check dates of food regularly & date mark containers
- Dried food should be correctly stored & covered

**Prevention during preparation & cooking**

- Personal hygiene (hands washed before cooking, after touching raw food, after coughing/sneezing, clean apron, blue plasters on cuts, hair nets)
- Colour coded food equipment, boards/knives.
- Only take food out of fridge when ready to prepare/cook
- Separate ready to eat and raw foods
- Check hot hold/fridge temperature every 2 hours



Bacteria type	Onset time Duration of symptoms	Symptoms (side effects)	Sources (where it comes from)
Salmonella	O: 2-3 days D: a week	Diarrhoea, stomach cramps, vomiting	Raw meat, sea fish & eggs Fruits and vegetables
Campylobacter	O: 12-72hrs D: Up to a week	Diarrhoea (may be bloody), stomach cramps, vomiting.	Unpasteurized (raw) milk & poultry
E-coli	O: 2 days D: Up to 10 days	Diarrhoea (may be bloody), stomach cramps, vomiting.	Undercooked ground beef (faeces in intestines) Unpasteurized dairy. Raw fruit & veg - water on crops
Clostridium Perfringens	O: Within hours D: Up to 2 days	Diarrhoea, stomach cramps (no vomiting)	Raw meat, gravies, food left for long periods at room temperature
Listeria	O: Up to 3 months D: Days – weeks	Diarrhoea, vomiting, nausea, high temperature, aches & pains, chills	Unpasteurized dairy products. Raw fruits & vegetables
Bacillus Cereus	O: 1-16 hrs D: Up to 2 days	Diarrhoea, stomach cramps, vomiting, nausea	Cooked rice being reheated
Staphylococcus Aureus	O: 1-6 hrs D: Up to 3 days	Diarrhoea, stomach cramps, Sudden vomiting & nausea,	Throat and mouth (i.e. chef coughing) Skin (i.e. chef not washing hands)

**3) Allergies & intolerances**  
 Businesses must act responsibly towards this by

- advising customers about ingredients in their food
- label food and menus correctly
- avoid contaminating food with allergens
- recognise & know what to do if a customer has a reaction

**ALLERGENS AND THEIR ALLERGENIC COUNTERPARTS - TROW OUT**

DISHES	Wheat	Gluten	Eggs	Fish	Crustaceans	Milk	Almonds	Tree Nuts	Soya	Mustard	Sulphites
Plain Flour	✓	✓									
Plain Flour (Wheat)	✓	✓									
Plain Flour (Soya)									✓		
Plain Flour (Eggs)			✓								
Plain Flour (Milk)						✓					
Plain Flour (Mustard)										✓	
Plain Flour (Sulphites)											✓

**Allergy:** A serious & possible life-threatening reaction to a food or ingredient. The common allergens are:

- eggs
- fish
- milk
- peanuts
- gluten
- sesame
- celery
- mustard
- soybeans
- molluscs (mussels & oysters)
- tree nuts (hazelnut, almond, walnut, cashew)
- lupin (a gluten free flour)
- crustaceans (prawn, crab, lobster)
- sulphur dioxide/ sulphites (a preservative)



**Intolerance:** Digestive issues/feeling unwell after eating certain foods. They cause a slower/less instant reaction compared to an allergic reaction. Causes digestive issues & stomach pains/bloating/diarrhea (rather than immune system response)

**Lactose intolerance:**  
 Cannot digest lactose (a sugar in milk) properly so bacteria in the intestine have to break it down which then produce gas  
 Avoid: milk & dairy (yogurt, cheese, butter)  
 Alternatives: lactose free dairy/milk/yogurt  
 Dairy free milks such as almond, soya, rice



**Coeliac/gluten intolerance:**  
 Reaction to gluten - in wheat, barley, oats, rye. Most flour is made from wheat so cannot eat food made from wheat (pasta, bread, pastry, cakes etc). As well as the symptoms they can also lack energy (lack of carbohydrates)  
 Alternatives: Gluten free flour or other products such as bread. Almond flour, gram flour, linseed.  
 Coeliac: eating gluten can cause long term issues  
 Gluten intolerance: eating gluten = short term discomfort



**How to achieve a distinction**

- Ensure you explain a range of ways to prevent food illness & include justification/ reasons (i.e. ensure raw meat is cut on a red board, & salad on a green board to prevent cross contamination from a high risk to a ready to eat food)
- Ensure you can suggest a range of dishes suitable for intolerances
- Include key temperatures in answers with justification & links to bacteria (e.g. hot hold ensures bacteria do not enter danger zone)

**Bacteria** - microscopic organisms that multiply (pathogenic=harmful)  
**Yeast** - a microscopic fungus that can ferment sugar (produce alcohol & CO2)  
**Mould** - a furry growth of fungi that can grow and spoil food  
**Cross contamination** - When bacteria is transferred from one place to another  
**Danger zone** – bacteria multiplies most as it is warm (5-63°C)  
**FIFO** – First in first out – new stock is put behind old stock, so old stock is used first  
**90-minute rule** – cooked food should be cooled and refrigerated within 90 minutes  
**Hot hold** - cooked or reheated food is held hot prior to and during service to consumers (at 63°C)  
**Binary fission** - bacteria makes a copy/splits into two every 20 minutes in the correct conditions  
**Personal hygiene** – the cleanliness of the food handler (i.e. hands washed, apron on, hair tied up)  
**Kitchen hygiene** – the cleanliness of the kitchen & work area (i.e. clean benches)  
**Onset** – the time between eating the contaminated food and symptoms appearing  
**Duration** – the time the person has the symptoms  
**Symptoms** – the side effects of something (i.e. a symptom of a cold is a runny nose)  
**Sources** – where something comes from (i.e. a source of salmonella is eggs)  
**Allergy** – a more severe immune response/reaction to something  
**Intolerance** – an inability to eat something without adverse effects (i.e. gluten)  
**Anaphylaxis** – a severe and potentially fatal reaction to something especially nuts  
**Coeliac disease** - a condition where immune system attacks the tissues when gluten is consumed.  
**Gluten** – a protein found in wheat flour, barley & rye (wheat flour - in bread, pastry, pasta, cakes)  
**Lactose** – a sugar found in milk (milk is in dairy products such as yogurt, cheese, cream)

**Key Terms**



**Legislation** Important to protect health

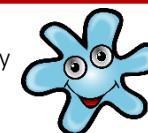
It also protects business as:

- Staff are trained correctly
- Working conditions are good so staff can comply
- Prevent customers making false claims



**3 laws/pieces of legislation**

1. Food Safety Act
2. Food Hygiene Regulations
3. Food Labelling Regulations



**Law 2. Food hygiene regulations (&HACCP)**

Require food to be stored, handled, cooked & served safely & hygienically

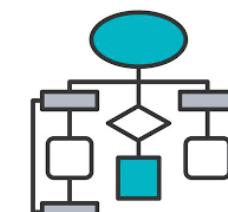
Apply to all food businesses who must ensure:

- Food is produced safely (*personal hygiene, pest control, staff training, cleaning & temperature records*)
- Records of suppliers are kept to trace where food came from

Food businesses should ensure they meet food safety & hygiene regs using HACCP systems to ensure they show due diligence (being able to prove reasonable actions were taken to avoid risk)

HACCP = hazard analysis critical control point (a system to identify hazards & minimise risks):

1. Create a table or flow chart of the process
2. Analyse each step to identify the hazard
3. Identify what can be done to control/prevent the hazard
4. Set guidelines for each control/prevention (critical control points/limits) e.g. fridge temperature
5. Keep reviewing the system



**HACCP example for a takeaway**

Stage	Potential hazard (hazard analysis)	Controls in place (Critical control point)
<b>Purchasing ingredients</b>	Suppliers may not be hygienic Food may be out of date Meat may not be fresh Delivery van temperature in danger zone	Suppliers visited to check measures Check dates on arrival Check temp of van Reject order if not met
<b>Storage</b>	Fridge may not be 0-5 Dry storage may be contaminated by pests Ready to eat food may be contaminated by meat	Regular checks & records logged Regularly checked and serviced Well ventilated, clean dry stores Use FIFO
<b>Preparation</b>	Meat may contaminate ready to eat food Meat may be in danger zone for too long Cross contamination by food handler	Store separately Meat only taken out of fridge when ready to prep Personal hygiene checks and training
<b>Cooking</b>	Meat may not be thoroughly cooked	Cook to 75C, use a Food probe and Timer
<b>Serving</b>	Cross contamination by food handler Food may enter danger zone Contamination by packaging	Use tongs / serving equipment – not hands Use hot hold – 63 Clean storage, protected from pests
<b>Washing up</b>	Food not washed off equipment properly Walls and surfaces get food trapped in from splashed etc	Dishwasher Daily cleans at end of day Weekly deep cleans
<b>Waste disposal</b>	Scraps attract pests	Secure bins, collected weekly, outside

**Law 1: Food Safety Act**

Cover all food production & sale chain.

(production, processing, storage, distribution & sale)

- Safe to eat (nothing unsafe added)
- What people expect (e.g. not food which is meant for pets)
- Not misleading (e.g. not horse meat in a lasagne)



**Law 3. Food labelling regulations** To inform and educate consumers about food they choose to buy. Packaging must be:

- Clear & easy to read/understand
- Permanent
- Easily visible
- Not misleading



The following must be shown by law (mandatory)

- Name of the food
- List of ingredients
- Ingredients causing allergies or intolerances
- Quantity/weight
- Use by date
- Storage
- Business name & address of business name
- Country of origin/place of provenance
- Instructions for use/cooking instructions
- Nutritional information (*energy, fat, saturated, carbohydrates, sugars, protein, salt, vitamins & minerals*)

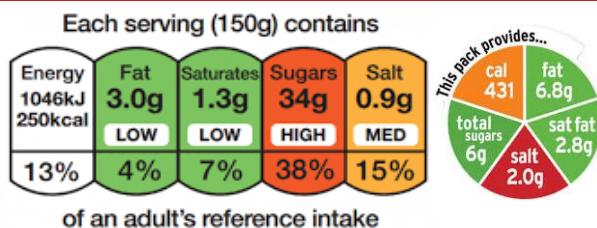
**Traffic light labelling**

This is voluntary but provides a summary of the nutritional content (energy, fat, sugar & salt) so consumers can compare & see 'at a glance'

It also shows a percentage of the reference intake

e.g. If it says 49% for fat, it means the portion contains nearly half of the recommended fat intake for the day

**Red = high, amber = medium, green = low**



**Use by date** – must be used by to prevent food illness. **Best before date** - not harmful to eat after this date but quality reduced

**EHO (Environmental Health Officer)**

Enforce environmental health laws by inspecting premises in order to ensure the food an establishment produces is safe to eat.

**Responsibilities:**

- Carry out routine or unplanned visits
- Follow up outbreaks of food poisoning
- Follow up complaints from the public
- Collect samples for testing
- Give hygiene star ratings
- Give evidence in court
- Give the owners advice
- Give talks at public meetings and exhibitions
- Check documentation (temp logs, cleaning logs)
- Take photos, videos, drawings, interviews

**Qualities:**

- Communication
- Negotiation
- Ability to explain laws
- Ability to work methodically
- Problem solving
- Time management
- Ability to work with people fr

**Qualifications :**

- A degree in environmental health or food science



**Legislation** - a law or set of laws

**Prosecute** – take someone to court for committing a crime

**Mandatory** – required by law; compulsory

**Due diligence** - reasonable steps taken by a person to avoid committing an offence

**Food Safety Act** – law to ensure companies treat human *food* in a controlled and managed way

**Food Hygiene Regulations** – law to ensure companies make sure that their activities are carried out hygienically.

**Food Labelling Regulations** – the information and standards regarding information of food packaging/labels.

**Food Standards Agency** - responsible for food safety and food hygiene in England, Wales & Northern Ireland.

**Country of origin/place of provenance** – where the food comes from

**Traffic light label** - a system where red, amber & green are used to represent high, medium or low amounts of sugar, fat, salt etc

**Reference intake** - how you the maximum amount of calories and nutrients you should eat in a day

**EHO** - Enforce environmental health laws by inspecting premises in order to ensure the food an establishment produces is safe to eat.

**Documentation** - documents that provide information or evidence or that serves as a record.

**Prohibition notice** – must stop selling food straight away – cannot resume until actions to remove or control the risk are removed.

**Improvement notice** - when a restaurant doesn't comply with hygiene laws - needs to be fixed by a certain time (can stay open)

**HACCP** – (Hazard analysis critical control point) - a management system in which food safety is addressed through the analysis & control of hazards throughout the whole process.

**Hazard analysis** - deciding what might be a hazard, and what should be done if someone or something is exposed to this hazard.

**Critical control point** - a step in Food Handling where controls can be applied to prevent or reduce any food safety hazard.

**Key Terms**

