

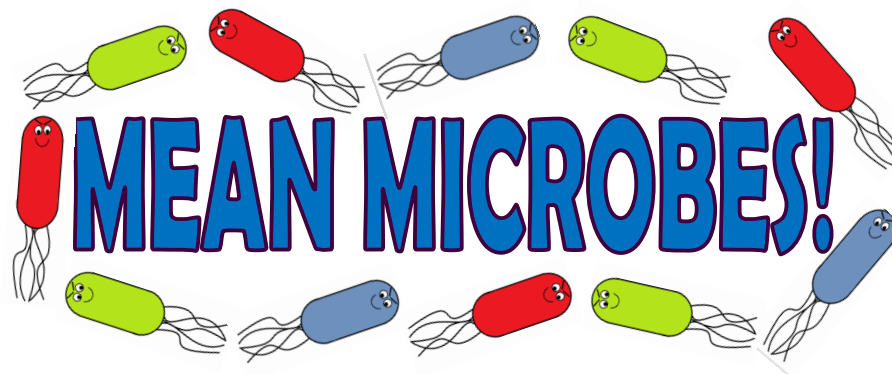
Top tips for keeping mean microbes away:

- Always keep raw food and cooked or ready-to-eat food separate and don't forget to use different chopping boards.
- Always wash hands before preparing food and after handling raw meat.
- Try to keep pets out of the kitchen and clean any surfaces that your pet comes into contact with immediately.
- Keep work surfaces and equipment clean at all times.
- Keep the temperature of the fridge under 5°C and the temperature of the freezer under -18°C.
- Always keep raw meat at the bottom of the fridge and clean up any meat juices as soon as possible.
- Put all chilled food in the fridge as soon as possible and keep it there. Watch out for raised yoghurt lids, a sign that mean microbes are at work!
- Make sure that food is cooked properly, it should reach a temperature of 72°C in order to kill all the mean microbes which may be on the food.
- Do not eat foods that are past their use by date. Use by dates are decided by scientists, who carry out tests on the food to see how long it is safe for. Best before dates are only recommendations and have not been scientifically tested. However, you must still be careful and check the food for signs of mean microbes before eating it if the best before date has passed!

To find out about the research being undertaken at the Institute of Food Research on Campylobacter, Salmonella and Clostridium botulinum, scan the QR code to be taken to the IFR website:



References: Food Standards Agency: www.food.gov.uk/
Public Health England: www.gov.uk/government/organisations/public-health-england



What are microbes?

Microbes are living things which are so small that they can only be seen using a microscope. There are three types: bacteria, viruses and fungi. Microbes are all around us; in the air, in water, in soil, on people, animals and plants!

What are mean microbes?

Mean microbes are the bad guys, scientists call them pathogens. A pathogen is a microbe which can cause disease. There are many pathogens which can cause food poisoning and it is these that this leaflet will give you more information about. Open up to find out more...



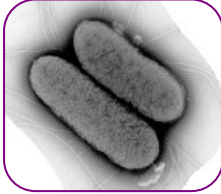
By Amy Edwards
Communications Intern
2014

Examples of mean microbes

Name: Salmonella

Found in:

Raw meat, poultry, eggs and raw vegetables.



Mode of action: Invades the cells lining the gut and produces toxins.

Symptoms: Abdominal pain, diarrhoea, vomiting and fever.

Stats: Kills 100 people each year in the UK.

Name: Clostridium botulinum

Found in:

Canned meat/vegetables/fish, meat and poultry.



Mode of action: Produces a deadly toxin.

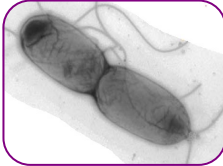
Symptoms: Impaired vision, paralysis, vomiting and diarrhoea.

Stats: Causes death in 5-10% of cases.

Name: Escherichia Coli

Found in:

Raw/undercooked meat, unpasteurised dairy products, raw vegetables.



Mode of action: Produces a toxin that destroys blood cells.

Symptoms: Diarrhoea which may contain blood, can lead to kidney failure and death.

Stats: Has affected over 8,500 people in the UK since 2004.

Name: Campylobacter jejuni

Found in:

Poultry, meat and milk.



Mode of

action: Sticks to, invades and destroys the cells lining the gut.

Symptoms: Abdominal pain, diarrhoea and fever. Can cause damage to the nervous system.

Stats: Considered responsible for 280,000 cases of food poisoning a year in the UK.

Are all microbes mean?

No, most microbes are harmless and some are very useful indeed!

- In our gut there are trillions of bacteria which help us digest food.
- Yeast is a microbe added to bread to help it rise. It is also used to make beer and wine.
- Lactobacillus bacteria are added to milk to make yoghurt.

What do mean microbes need to grow?

Mean microbes need:

- **A temperature of 5-63°C** - below this it is too cold for the microbes to grow and reproduce and in high temperatures above 63°C the microbes begin to die.
- **Food** - microbes need a source of nutrition to survive.
- **Moisture** - microbes need water to survive.
- **A pH above 4** - pH is a measure of acidity; the lower the pH, the more acidic an environment is. Mean microbes cannot survive in a very acidic environment.

When conditions are just right, some microbes can multiply every 20 minutes which means that one microbe could turn into 2,097,152 microbes after just 7 hours!