

# Antimicrobial resistance (AMR)

Antimicrobial resistance and the steps to take to prevent the spread of resistant microorganisms.

Antimicrobial resistance (AMR) is a major public health issue worldwide. It is a complex issue driven by a variety of interconnected factors. AMR occurs when microorganisms (e.g. fungi, bacteria, viruses and parasites) evolve to resist the effects of treatment.

Antibiotics are used to treat infections caused by bacteria. It is possible for bacteria to change and adapt. The bacteria can find new ways to survive the effects of an antibiotic, making it and related antibiotics less effective. Resistant bacteria make bacterial infections harder to treat, increasing the risk of severe illness and death.

## How AMR spreads

The use and misuse of antimicrobials in humans and animals contributes to the development and spread of AMR bacteria through many routes. Resistant bacteria can be spread to humans in the food chain through:

- animal slaughtering processes – meat can be contaminated by resistant bacteria present in the animal's digestive tract
- manure – resistant bacteria in animal faeces used to fertilise land can transfer to the environment
- water – vegetables, fruit and shellfish can become contaminated if the water or soil used to grow them contains AMR bacteria
- cross-contamination – food handled without the right hygiene practices can spread resistant bacteria from one type of food to another or from the environment to food

## How you can avoid spreading AMR

AMR bacteria can make antibiotics, including those used for treating humans, less effective. The risk to public health from AMR microbes in food can be reduced in similar ways to that of non-AMR microbes in food.

The risk of acquiring AMR related infections through the handling and consumption of contaminated meat is **very low** providing that good hygiene and cooking practices are followed. It's important to follow the '4Cs' when transporting, storing and preparing food.

The 4Cs are:

- [cleaning well](#)
- [cooking thoroughly](#)
- [chilling correctly](#)
- [avoiding cross-contamination](#)

Thorough cooking is crucial as it will destroy bacteria that may be present in foods including those that are AMR. Good hygiene practices at all stages of the food chain are also important as this will help to reduce the risk of contamination and spreading AMR bacteria to other foods. It will also reduce the risks of getting food poisoning.

If you are planning to eat raw fruit or vegetables, make sure you [wash them thoroughly first](#). You should wash them under a running tap, or in a bowl of fresh water, making sure to rub their skin under the water. You can start with the least soiled items first and give each of them a final rinse. Peeling can also help remove contamination.

## FSA Explains

The term antimicrobial includes any substance that kills or stops the growth of microbes. Antimicrobials include antibiotics, antifungals, antivirals, disinfectants and other drugs. Antibiotics are used to treat bacterial infections in both humans and animals. They have no effect on viruses or fungal infections. Examples of antibiotics include:

- penicillin
- tetracycline
- erythromycin
- streptomycin

Improper use of antibiotics can increase the chance that bacteria will adapt and become resistant to them. Resistant bacteria can thrive when non-resistant bacteria are killed off by antibiotics because there's less competition for food and resources.

## What we are doing about AMR

We started a rolling surveillance programme to monitor AMR in 2015. This has primarily focused on meat on retail sale in the UK, which established baselines and provides monitoring data of AMR trends. We are continuing to commission research and surveys to improve our understanding of the role that the food chain plays in the development and spread of AMR. Our AMR surveillance programme focuses predominantly on retail meats mainly chicken, pork and beef (and recently expanded to include turkey and lamb).

Tackling AMR remains a high priority for the UK Government and the new [5-year National Action Plan](#) (NAP) for 2024-2029 builds on the progress made in the previous 5-year NAP and lessons learned from COVID-19. The plan sets ambitious targets to drive down inappropriate use of antibiotics and stimulate further development of new drugs and vaccines.

We can track antimicrobial-resistant infections and study how resistance emerges and spreads. Detecting and investigating outbreaks of antimicrobial-resistant infections enables us to identify their sources and stop their spread. Fully integrated surveillance initiatives are crucial to understanding and mitigating the risk of AMR. Our shared need for knowledge gaps to be filled include transmission from people to animals as well as animals to people, both direct and through the environment.

The [PATH-SAFE programme](#) has made some large advances in this area, and the National Biosurveillance Network initiative has the potential to build on that as we embed cross-disciplinary working to better understand and mitigate AMR risks.