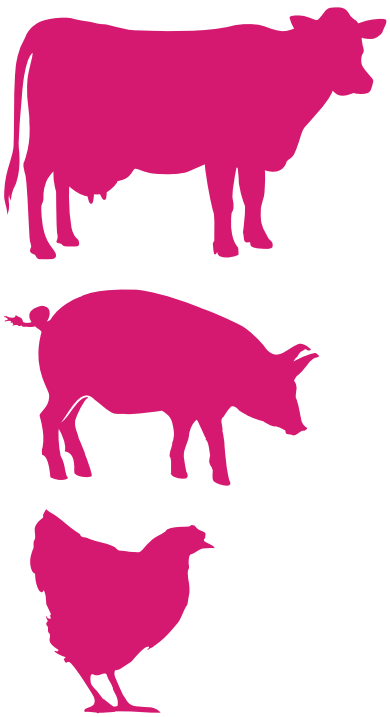
Veterinary
Medicines
Directorate

Highlights

UK-VARSS 2025

Published November 2026





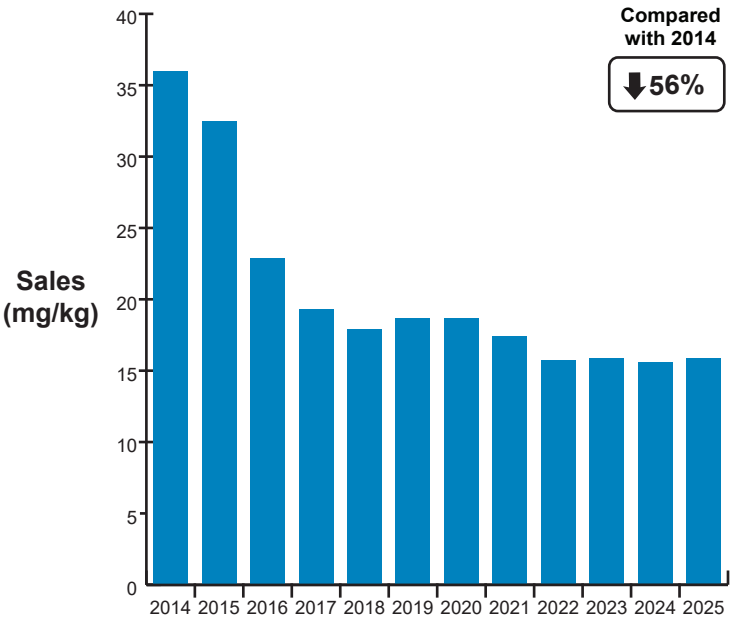
Antibiotic use and resistance 2014-2025

Key trends in antibiotic use and resistance since 2015

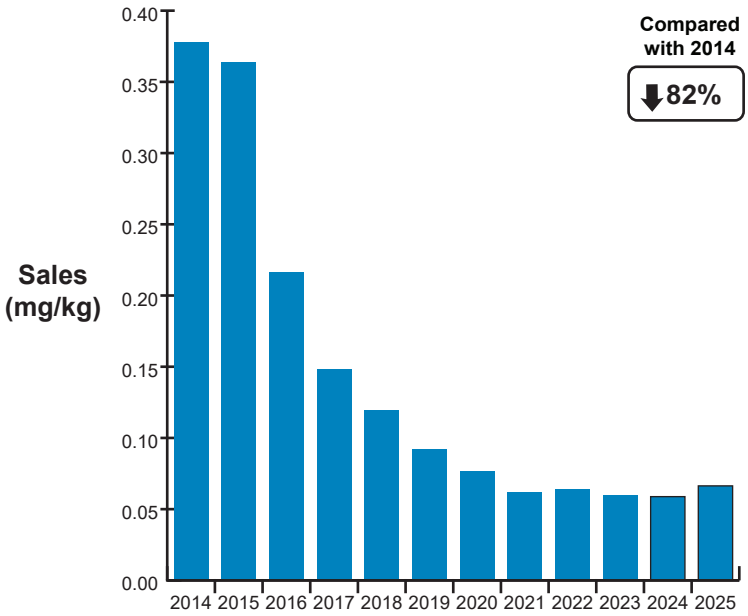
The UK-VARSS report brings together data on antibiotic sales, use and resistance. This allows us to show long term trends and acts as an early warning sign for emerging issues in antibiotic use and resistance.

Sales for food-producing animals (mg/kg)

Sales of antibiotics in food-producing animals 2014-2025

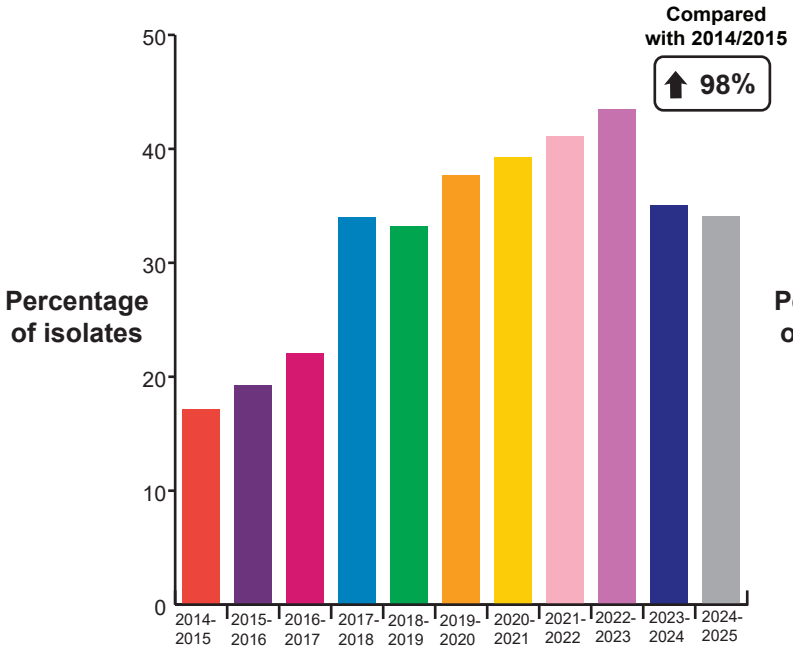


Sales of highest priority critically important antibiotics (HP-CIAs) in food-producing animals 2014-2025

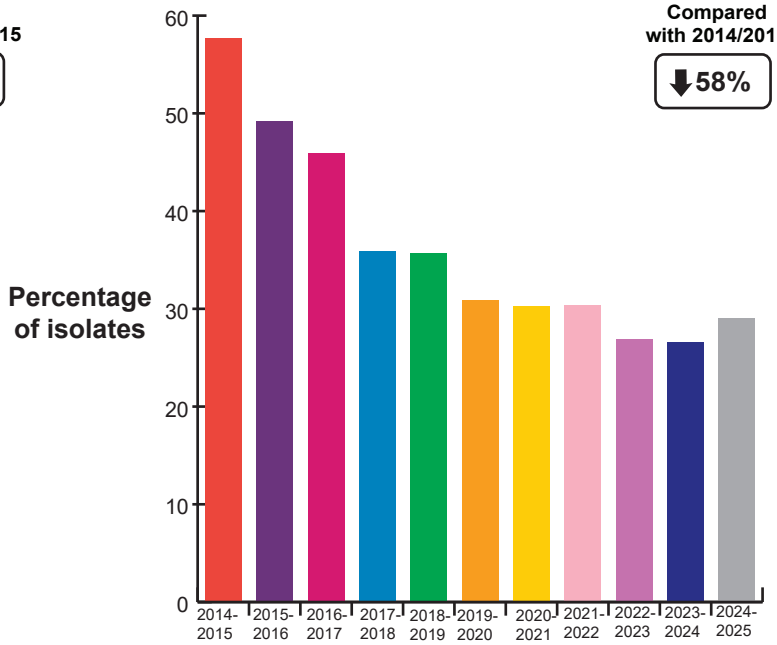


Resistance indicators for pigs and poultry

Percentage of fully susceptible *E. coli* isolates 2014-2025



Percentage of multi-drug resistant *E. coli* isolates 2014-2025

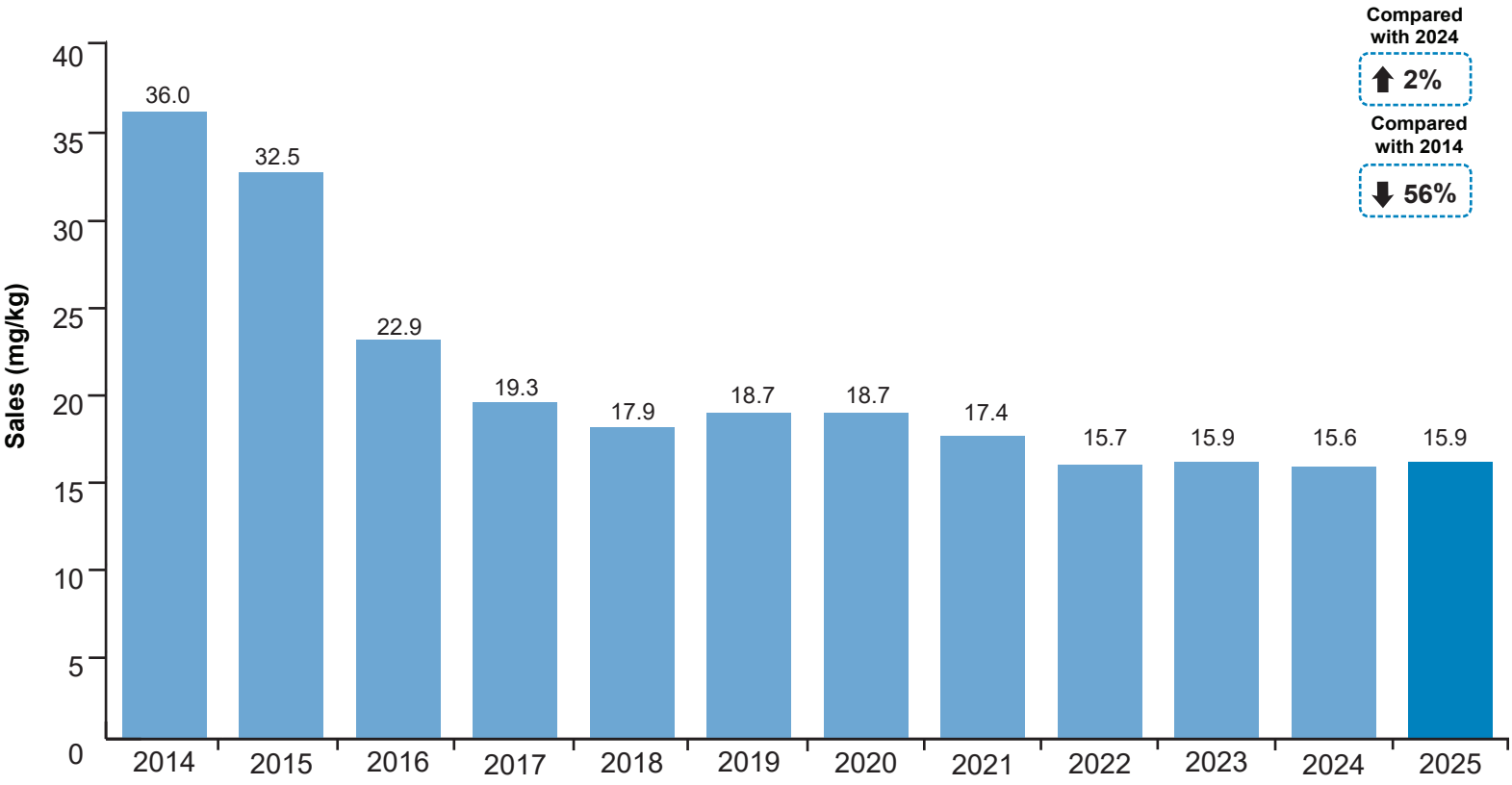


Indicators are an important tool for interpreting and comparing results of antibiotic use (AMU) and antimicrobial resistance (AMR) monitoring programmes.The indicators for sales and resistance are adjusted for population size. *E. coli* is the indicator organism for resistance. The outcome indicators for resistance are averaged over two years, due to the alternating schedule for AMR pig and poultry sampling.

Antibiotic sales

Sales for food-producing animals (mg/kg)

Sales of veterinary antibiotics for use in food-producing animals, adjusted for animal population, were 15.9 mg/kg in 2025. This represents a 2% (0.3 mg/kg) increase since 2024 and a 56% (20.2 mg/kg) decrease since 2014.



Over half of all antibiotics sold were either tetracyclines (33%) or penicillins (21%). Sales of highest priority critically important antibiotics (HP-CIAs) in food-producing animals remain at very low levels (0.07 mg/kg) and account for 0.4% of total sales in 2025.

	2014 (mg/kg)	2024 (mg/kg)	2025 (mg/kg)	Compared with 2014
Total HP-CIAs	0.38	0.06	0.07	⬇ 82%
Fluoroquinolones	0.20	0.05	0.06	⬇ 71%
3rd/4th generation cephalosporins	0.11	0.01	0.01	⬇ 93%
Colistin	0.07	0.00	0.00	⬇100%

Sales of antibiotics for all animals (tonnes)

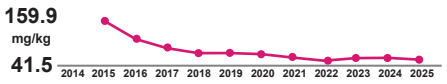
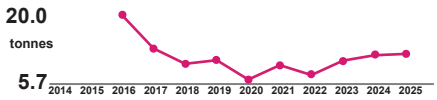
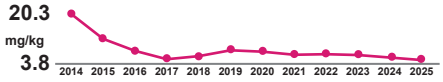
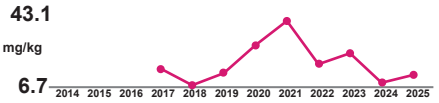
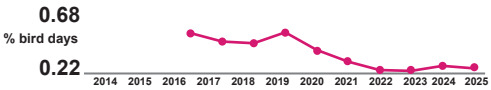
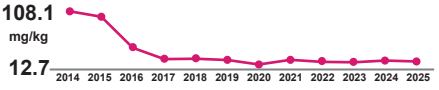
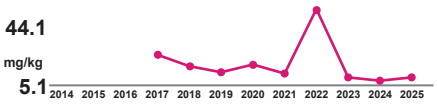
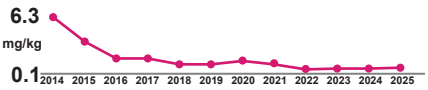
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Compared with 2014
452	411	299	256	238	243	242	228	205	200	194	195	⬇ 56%

Total amount of HP-CIAs sold in 2025 was 0.83 tonnes representing an increase of 4% (0.03 tonnes) since 2024 and a decrease of 83% (3.9 tonnes) since 2014. Sales of HP-CIAs continue to represent a very small proportion (0.4%) of total veterinary antibiotic sales in tonnes.

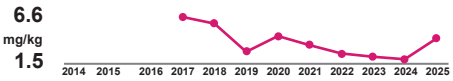
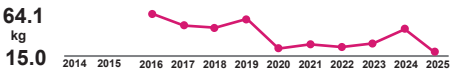
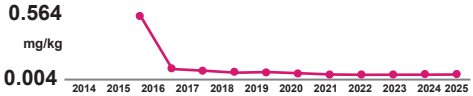
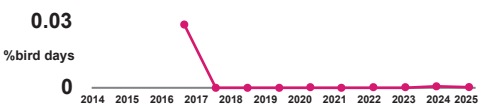
Antibiotic usage

Antibiotic usage refers to the amount of antibiotics prescribed and/or administered per sector. The data have been collected and provided to the VMD by the animal industry on a voluntary basis. Coverage is at least 83% for all sectors shown and calculated to represent the entire population.

Antibiotic usage by food-producing animal species

	2025 tonnage (● = 1 tonne)	2025 use	Change since 2024	Annual trends (scales differ beween graph starting with lowest figure reported)	% change from date first published
Pigs		44.8 mg/kg	↓ 5.3 mg/kg		↓72%
Gamebirds		11.4 tonnes	↑ 0.3 tonnes		↓43%
Broilers		3.8 mg/kg	↓ 0.9 mg/kg		↓81%
Salmon		12.4 mg/kg	↑ 4.2 mg/kg		↓23%
Laying hens		0.25 % bird days[1]	↓ 0.02 % bird days		↓62%
Turkeys		18.1 mg/kg	↓ 1.6 mg/kg		↓83%
Trout		6.9 mg/kg	↑ 1.8 mg/kg		↓64%
Ducks		0.3 mg/kg	↑ 0.1 mg/kg		↓95%

Highest priority critically important antibiotics by food-producing animal species

	2025 kg (○ = 1 kg)	2025 use	Change since 2024	Annual trends (scales differ beween graph starting with lowest figure reported)	% change from date first published
Trout		4.0 mg/kg	↑ 2.5 mg/kg		↓40%
Gamebirds		15.0 kg	↓ 30.1 kg		↓77%
Pigs		0.007 mg/kg	↑ 0.002 mg/kg		↓99%
Meat Poultry		0.0007 mg/kg	↓ 0.0001 mg/kg		↓99.9%
Laying hens		0.0003 % bird days	↓ 0.0004 % bird days		↓57%

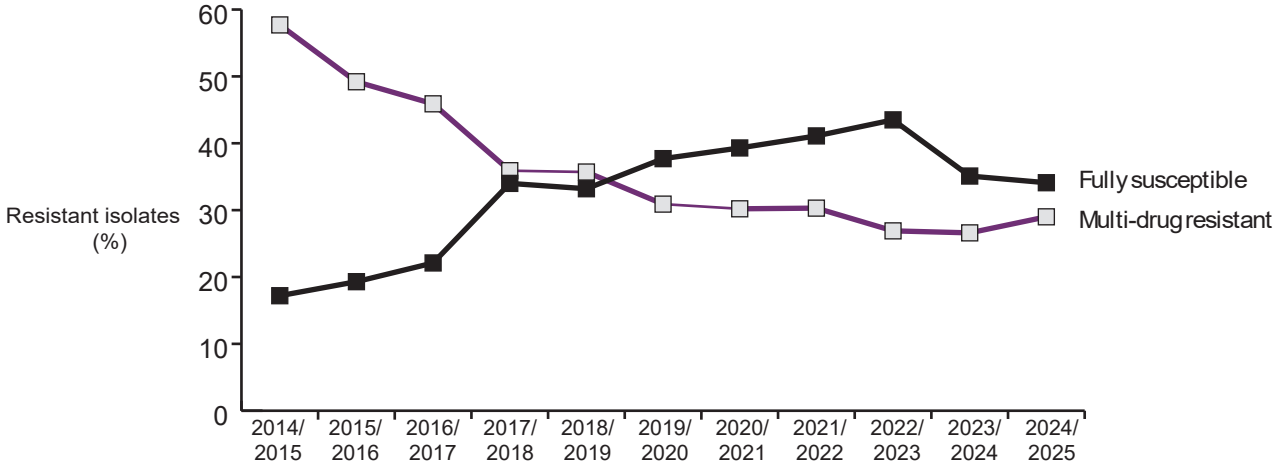
indicates different metric for usage

[1] BEIC have indicated that this relates to a single course of treatment adminstered to a breeder flock and not for birds producing eggs for the food chain

Antibiotic resistance - harmonised monitoring

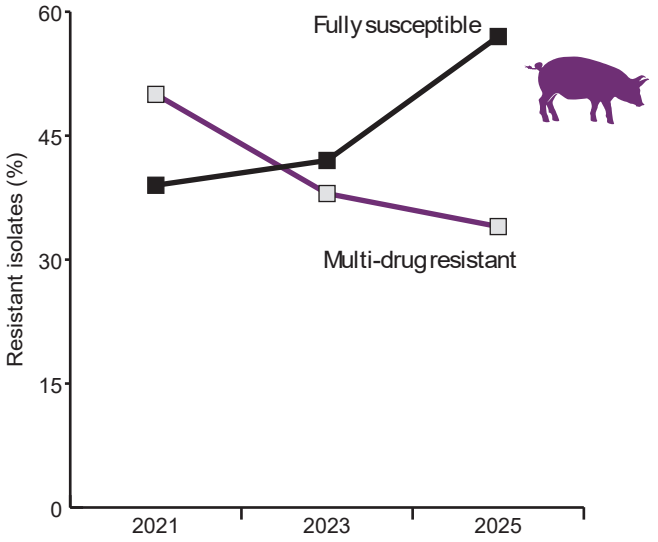
Key resistance outcome indicators: *E. coli*

The harmonised monitoring outcome indicators combine results from healthy pigs and poultry at slaughter to give an overall picture of AMR, and are internationally comparable. The percentage of *E. coli* with full susceptibility has remained at similar levels since its substantial decrease between 2023 and 2024. This is predominantly due to increased resistance in broilers in 2024 with a slight decrease in full susceptibility in pigs in 2025. Multi-drug resistance (MDR) has increased slightly by 2% in 2025, but remains significantly lower than in 2014/2015.



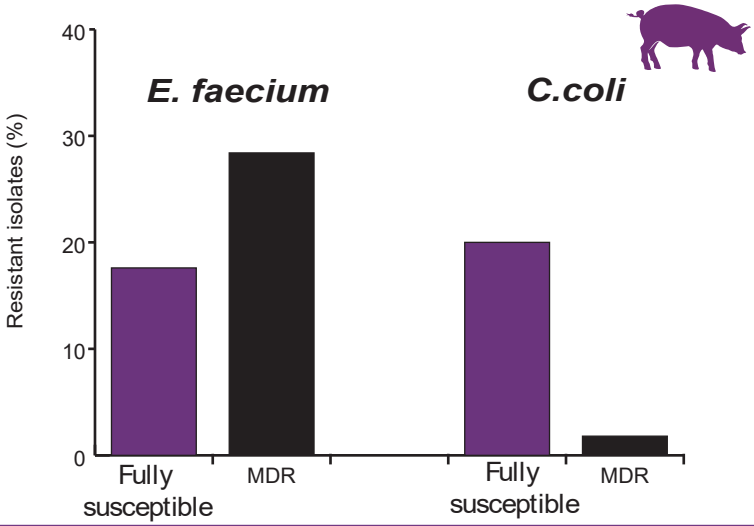
Resistance in *Salmonella*

Resistance in *Salmonella* in pigs showed the most notable improvement, with full susceptibility increasing to 57% in 2025. MDR continued to decrease and no resistance to HP-CIAs or human-only antibiotics were detected.



New surveillance

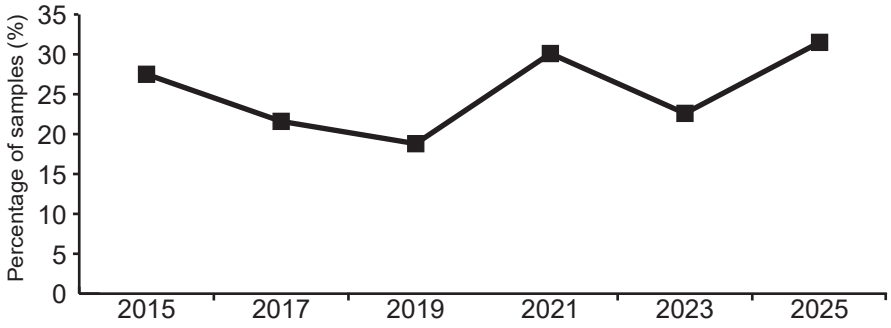
This is the second year enterococci and *C. coli* were tested in pigs. Resistance levels in both *E. faecium* and *C. coli* were similar to 2023, with 28% of *E. faecium* and 1.8% of *C. coli* being MDR. Vancomycin resistance was detected in *E. faecium* for the first time.



Using selective media to detect *E. coli*

We also perform a more sensitive type of testing using selective media which inhibits the growth of susceptible bacteria but allows bacteria with specific resistances to multiply, making them easier to detect. This tells us the percentage of individual samples containing resistance to the HP-CIAs, even when present in very low numbers. Carriage of ESBL-/AmpC-producing *E. coli* increased from 23% in pigs in 2023 to 32% in 2025. More than a third of these isolates were resistant to both third- and fourth- generation cephalosporins and fluoroquinolone antibiotics.

ESBL- and/or AmpC- producing *E. coli* from pigs 2015-2025



% Carbapenemase-producing *E. coli*



% Colistin-resistant *E. coli*



Antibiotic resistance - clinical surveillance

Clinical surveillance is a programme of passive surveillance that evaluates AMR in bacteria isolated from diagnostic samples, including those with zoonotic potential. As this kind of scanning surveillance is subject to biases and differences in the number of samples, the results are not representative of the UK's wider animal populations.

Overview of sampling

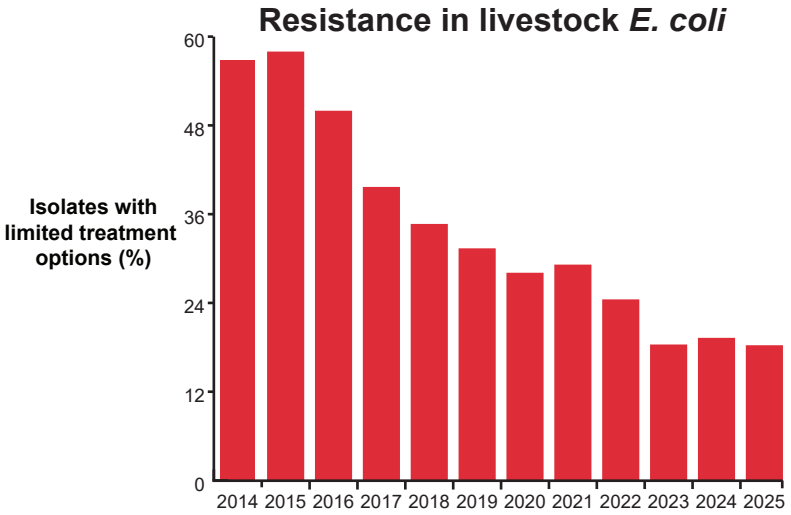
7,866 isolates were tested for AMR in England and Wales in 2025. Of these, 4,929 were *Salmonella* and 1,837 were *Escherichia coli*. Major sources of isolates included: poultry (26%), cattle (16%), pigs (15%), dogs (10%), sheep (8.9%) and feed (15%).

Percentage of *E. coli* in livestock with limited treatment options

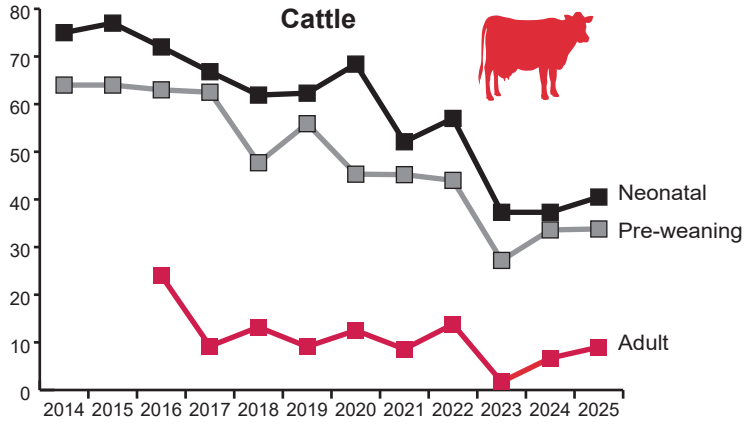
In 2025, 18% of all livestock *E. coli* isolates had limited treatment options (resistance to four or more antibiotics). This is a 68% reduction compared with 2014.

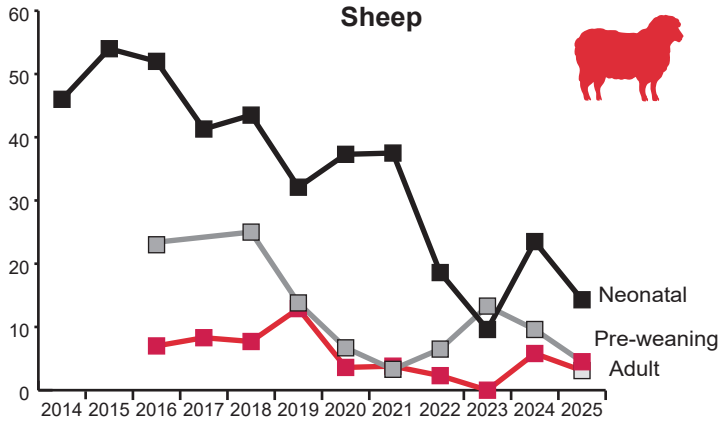
Higher resistance was observed in *E. coli* isolates from young animals than from adults.For lambs and calves, neonatal animals have the highest percentage of isolates with limited treatment options, whilst post-weaning pigs have higher resistance than neonates.

The percentage of *E. coli* with limited treatment options has declined substantially in young pigs, cattle and sheep since 2014.



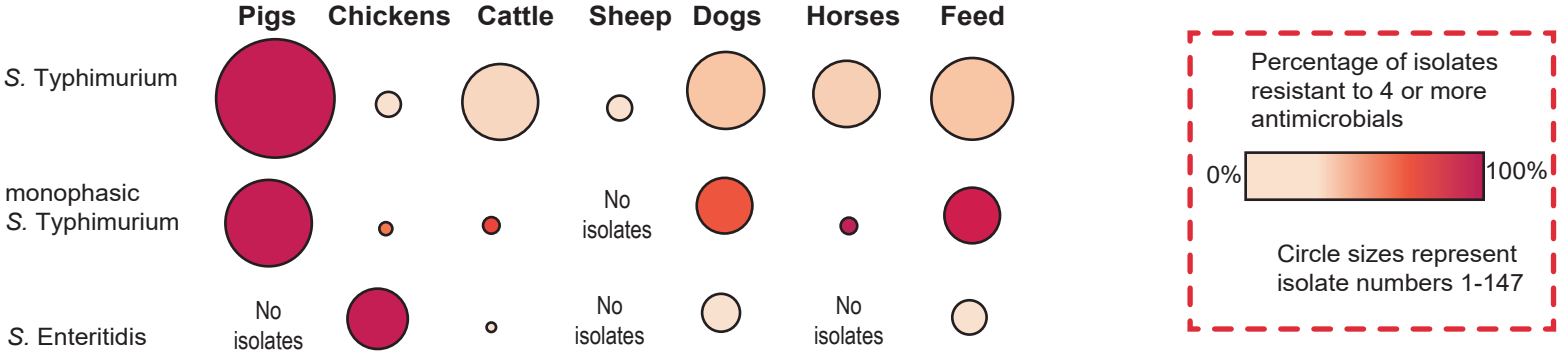
Limited treatment options (%) by age group





Resistance in *Salmonella*

Certain *Salmonella* serovars are regulated, due to public health concerns, and there are differences in resistance profiles between serovars as well as animal species. Monophasic *S.* Typhimurium isolates from pigs and feed, including raw pet food, had significantly higher levels of limited treatment options compared to all other sources.



Private Laboratories Initiative (PLI)

The PLI was established to help improve the sharing of AMR data held by private veterinary laboratories with government. This year, for the first time, the VARSS report includes verified data from cats and dogs provided by the University of Liverpool. Testing in dogs and cats covered four bacteria: *E. coli*, *K. pneumoniae*, *S. aureus* and *S. pseudintermedius*.

Background

How are sales data collected?
In the UK, from 2005 it has been a statutory requirement for pharmaceutical companies to report to the VMD the quantity of antibiotics sold for use in animals. This data does not take into account special imports of veterinary antibiotics not authorised for sale in the UK but authorised elsewhere, and some medicines may not be used in the same year (or at all if the product goes out of date before being used). However, they serve as the best currently available approximation of the quantity of antibiotics administered to animals within the UK.

How are usage data collected?
Antibiotic usage data, i.e. the amount of antibiotics purchased, prescribed and/or administered, has the potential to provide much more precise estimates of use as it allows antibiotic use to be split by species/sector and also include antibiotics imported under the special import scheme.

Antibiotic usage data collection systems have been put in place by the British Poultry Council (meat poultry), the British Egg Industry Council (laying hens),the Game Farmers Association and British Veterinary Poultry Association (gamebirds), the electronic Medicines Book (pigs), the British Trout Association (trout), Salmon Scotland (Salmon) and Medicine Hub (ruminants). This data has been voluntarily provided by producers (pigs, poultry and laying hens), feed companies (gamebirds) and veterinary practices (gamebirds and fish).

What are Critically Important Antibiotics (CIAs)?
HP-CIA refers antibiotics that are vitally important to human medicine and where there is the highest risk of transmission from non-human sources. These are defined by the World Health Organisation (WHO) List of Medically Important Antimicrobials, and include third- and fourth- generation cephalosporins, polymyxins (e.g. colistin) and quinolones/fluoroquinolones. This also aligns with “Category B” in the European Antimicrobial Expert Group report categorisation (AMEG).

How is antibiotic resistance interpreted?
Antibiotic resistance in bacteria isolated from animals is monitored through two distinct surveillance programmes: harmonised monitoring and clinical surveillance. The harmonised monitoring scheme is a UK-wide programme in which we test bacteria from the gut of healthy pigs and poultry at slaughter, and the National Control Programme for *Salmonella,* giving us a representative picture of resistance in key livestock species entering the food chain. Clinical surveillance involves the testing of bacteria that have been isolated from clinical samples submitted by farmers and private veterinarians to government laboratories in England and Wales.

Susceptibility testing for harmonised monitoring is performed using broth microdilution to determine minimum inhibitory concentrations (MICs). Resistance is assessed using EUCAST (European Committee on Antimicrobial Susceptibility Testing) epidemiological cut-off values (ECOFFs) where possible. Where no EUCAST values were available, European Food Safety Authority (EFSA) recommended cut-off values were used. Where neither defined values are available, tentative EUCAST ECOFF values were applied. Results interpreted using ECOFFs are reported in full in Supplementary Material 5.

In the 2025 clinical surveillance programme, the majority of the results presented were assessed by disc diffusion techniques, and interpreted using BSAC (British Society for Antimicrobial Chemotherapy) human clinical breakpoints (CBPs) where available. Broth microdilution testing was introduced in UK-VARSS 2020 and continues to be developed and applied to an increasing number of organisms over the last four years. MIC results have been interpreted using veterinary clinical breakpoints from Clinical and Laboratory Standards Institute (CLSI) in the first instance, or Comité de l’Antibiogramme de la Société Française de Microbiologie (CA-SFM) when these are not available; if veterinary clinical breakpoints were not available, human clinical breakpoints were used. Full details of the methods used are available in Supplementary Material 6.