FINRES-Vet 2023

Finnish Veterinary Antimicrobial Resistance Monitoring and Consumption of Antimicrobial Agents

SUMMARY

The full report is available at www.ruokavirasto.fi

RUOKAVIRASTO
Livsmedelsverket • Finnish Food Authority

fimea
Lääkealan turvallisuus- ja kehittämiskeskus
Säkerhets- och utvecklingscentret för läkemedelsområdet
Finnish Medicines Agency

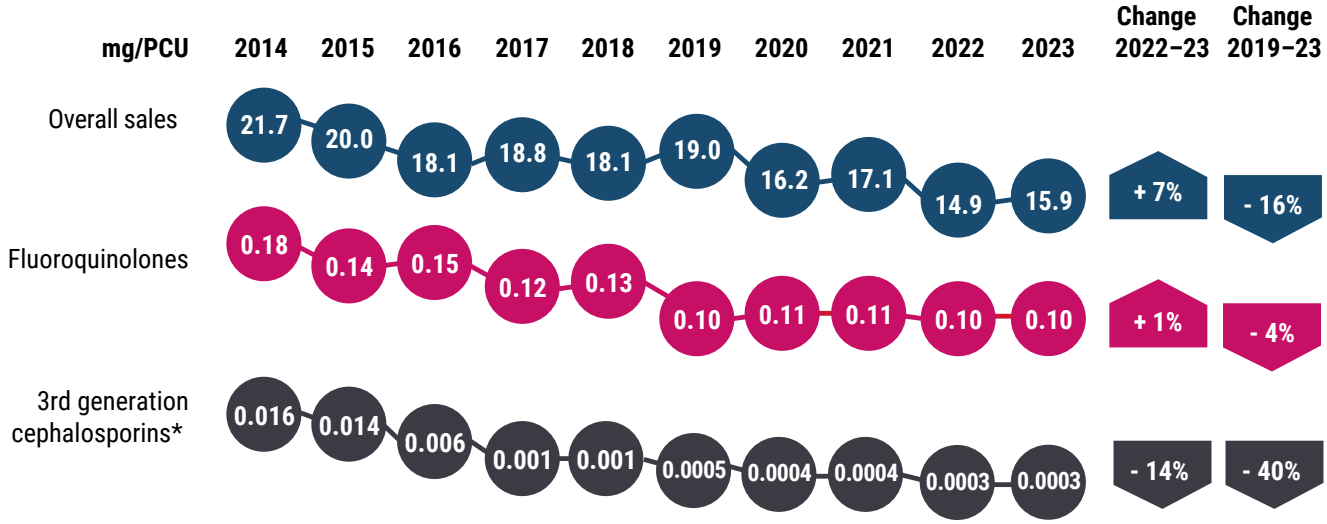
HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

Co-funded by the European Union

ANTIBIOTICS FOR FOOD-PRODUCING ANIMALS

EU-indicators for the sales of antibiotics in food-producing animals (mg/PCU)

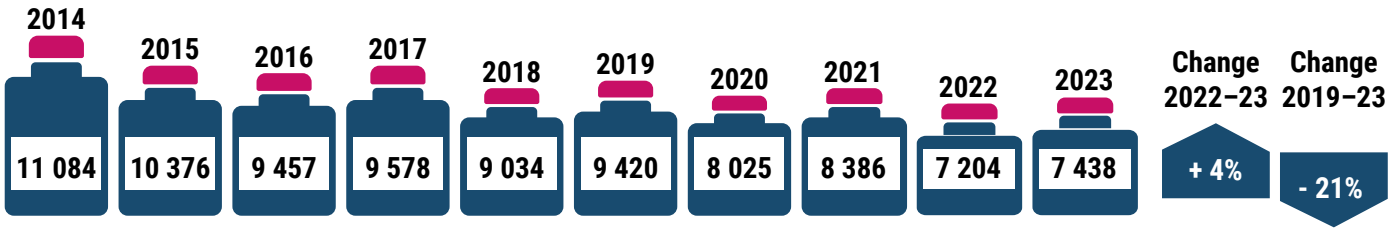
Population adjusted overall sales of veterinary antibiotics in 2023 was 15.9 mg/PCU, being the second lowest ever recorded. Overall sales increased by 7% from the all-time low in 2022 to 2023. Sales of critically important antibiotics for human medicine continued to be very low.



* Since 2017, 3rd generation cephalosporins have been sold only for the treatment of foals and companion animals.

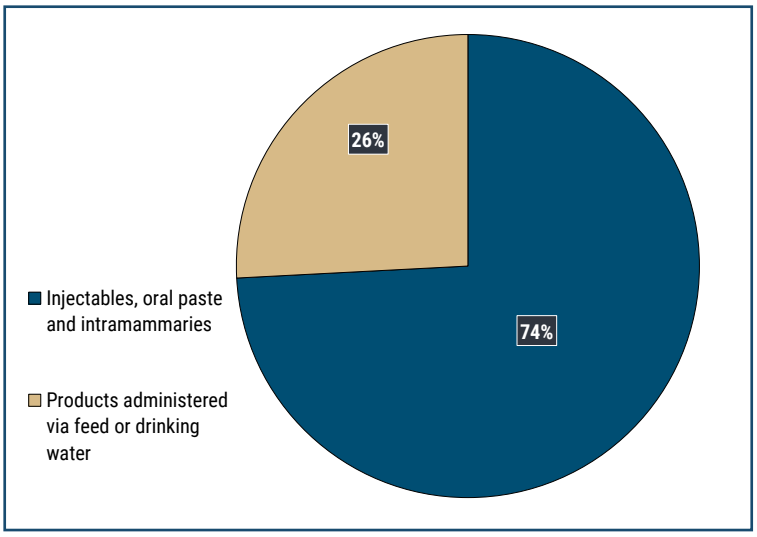
Total sales (kg active ingredient)

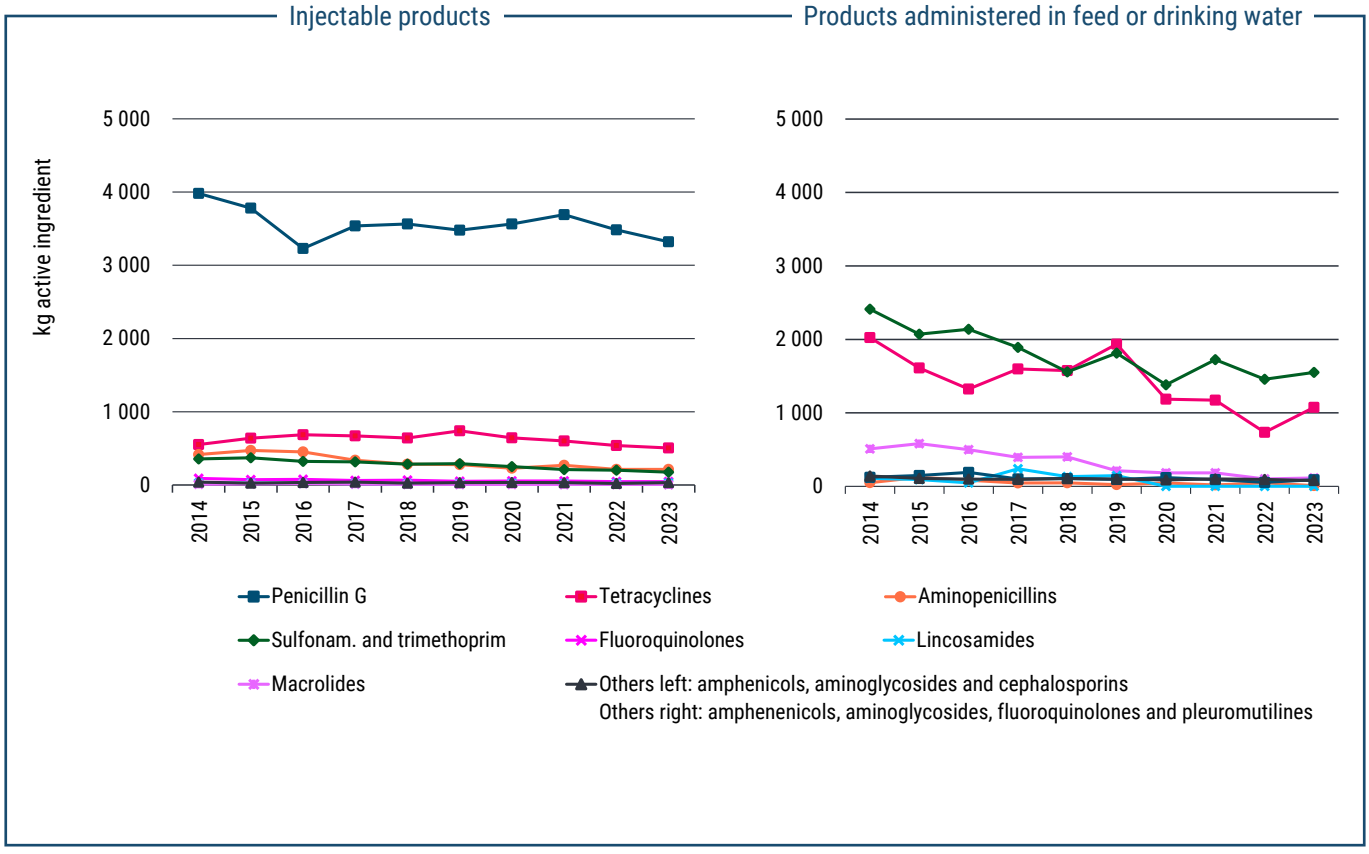
Total sales of veterinary antimicrobials for use in food-producing animals increased by 4% but was second lowest ever recorded. On international comparison sales of antibiotics in Finland continues to be modest and prudent both considering EU-indicators and total sales.



Sales by administration route (kg active ingredient)

Majority, 74%, of the antibiotics for food-producing animals continued to be products intended for treatment of individual animals (injectables, oral paste, intramammaries). The remaining quarter was antibiotics administered via feed or drinking water to groups of animals. By far the most used antimicrobial was injectable benzylpenicillin followed by oral sulfonamide-trimethoprim combination and oral tetracyclines.

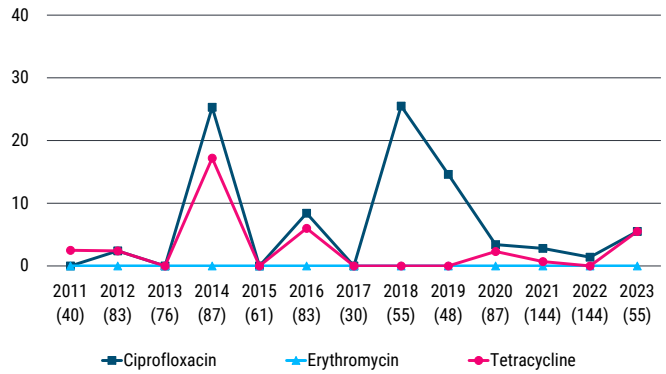




CAMPYLOBACTER IN FOOD-PRODUCING ANIMALS

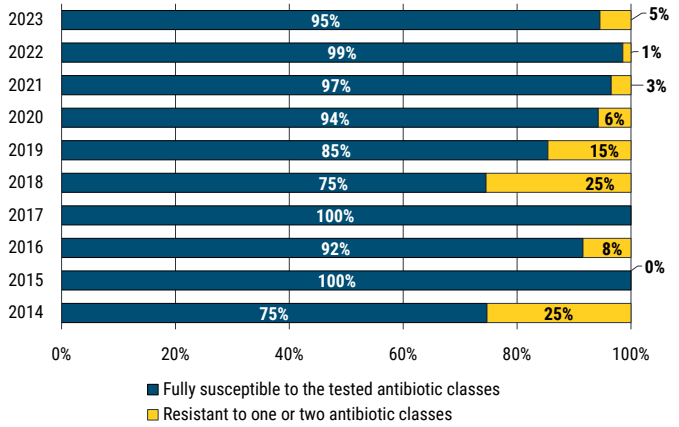
The majority of *Campylobacter jejuni* isolates from the national control programme have been fully susceptible to all tested antibiotics. The proportion of isolates resistant to quinolones and tetracycline has varied from 2014. Strains concurrently resistant to three or more antibiotic classes (multidrug resistance) have not been detected. Between 2020 and 2023 also tetracycline and ciprofloxacin resistance has remained at a low level (< 10%).

Resistance to ciprofloxacin, erythromycin and tetracycline in *C. jejuni* from broilers (%)



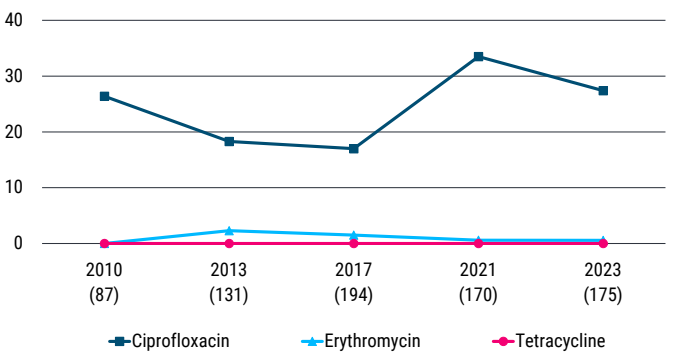
The number of tested bacterial strains are in brackets

Antibiotic susceptibillity in *C. jejuni* from broilers



Campylobacter coli isolates from pigs have shown significant resistance only to fluoroquinolone antibiotics, with the proportion of resistant isolates varying between 17 and 34%. In 2023, the proportion of isolates resistant to ciprofloxacin decreased by approximately six percentage points as compared to the previous study year 2021.

Resistance to ciprofloxacin, erythromycin and tetracycline in *C. coli* from pigs (%)



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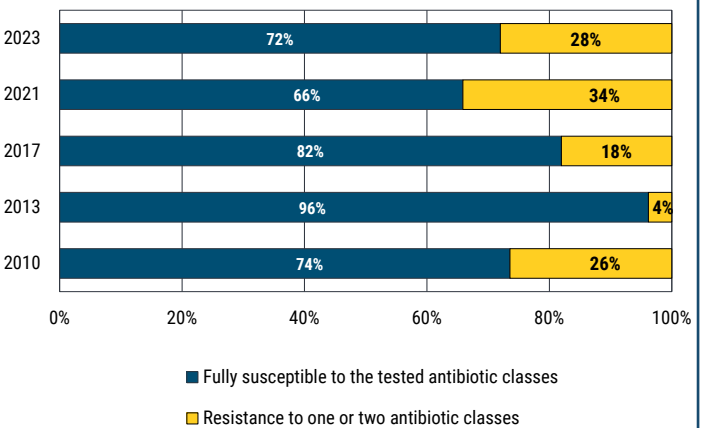
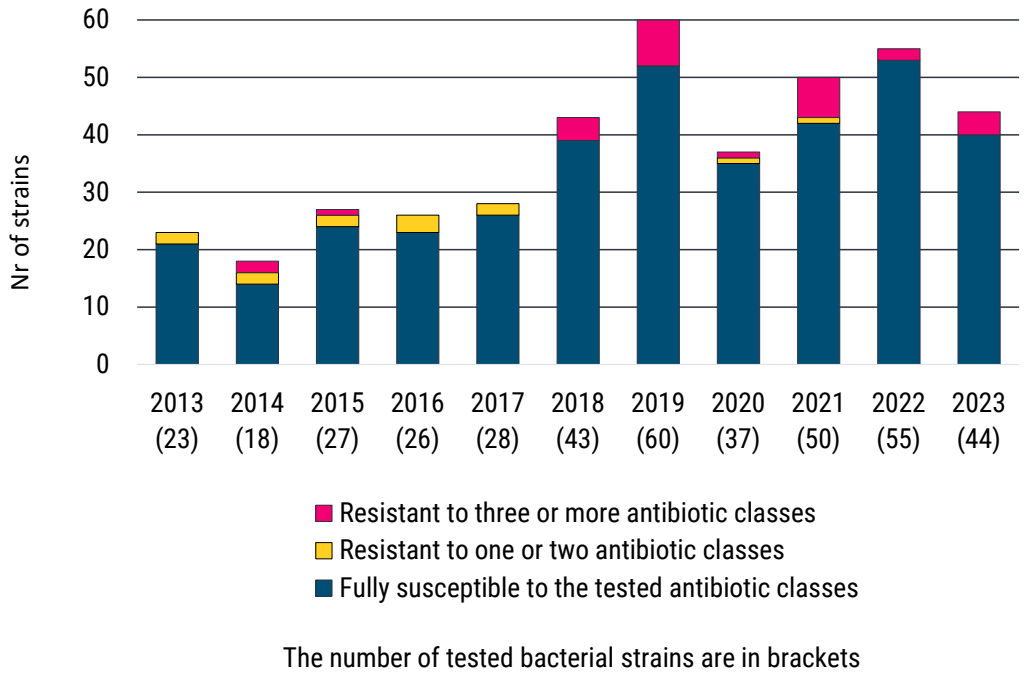
Antibiotic susceptibility in *C. coli* from pigs



SALMONELLA IN FOOD-PRODUCING ANIMALS

Salmonella isolated from Finnish food-producing animals have mostly been susceptible to the tested antibiotic classes. Multiresistant salmonella strains have been detected yearly since 2018, and they have originated from chicken, pig and cattle farms. In 2023, four salmonella isolates from broilers were resistant to several antibiotics.

Detected salmonella strains and their resistance in Finnish food-producing animals

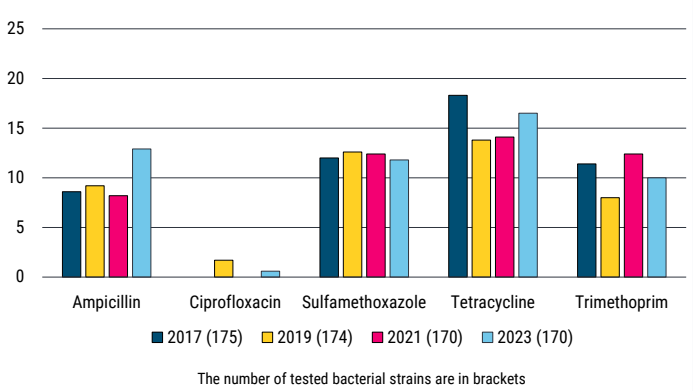


The number of tested bacterial strains are in brackets

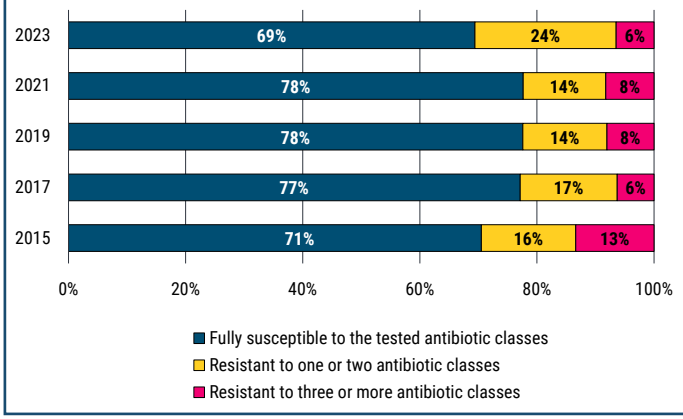
INDICATOR BACTERIA IN FOOD-PRODUCING ANIMALS

The majority of indicator *E. coli* isolates from pigs was fully susceptible to the tested antibiotic classes. Resistance was mostly detected against tetracycline, ampicillin, sulfamethoxazole and trimethoprim. The proportion of isolates resistant to one or two antibiotic classes increased in 2023. The proportion of multidrug resistance was 6% in 2023.

Resistance in indicator *E. coli* from pigs to selected antibiotics in 2017, 2019, 2021 and 2023 (%)



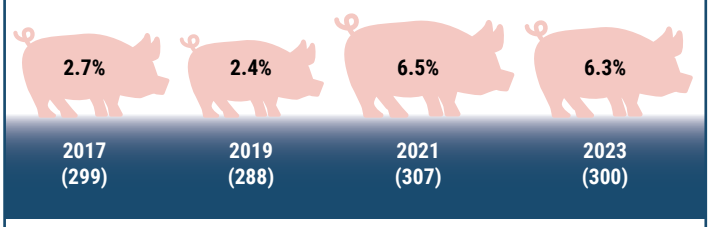
Antibiotic resistance in indicator *E. coli* from pigs



ESBL BACTERIA IN FOOD-PRODUCING ANIMALS AND MEAT

The prevalence of ESBL- and AmpC-producing *E. coli* in pigs at slaughter was at the same level as in 2021. In pork and beef samples taken at retail ESBL and AmpC findings have been rare. Carbapenemase-producing *E. coli* have not been found.

ESBL/AmpC-*E. coli* in slaughtered pigs (%)

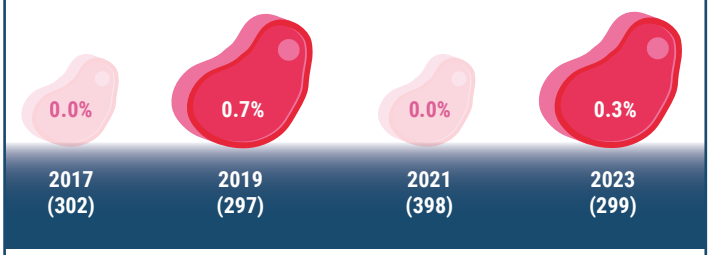


The number of tested samples are in brackets

ESBL/AmpC *E. coli* in fresh pork, at retail (%)

The number of tested samples are in brackets

ESBL/AmpC-*E. coli* in fresh beef, at retail (%)

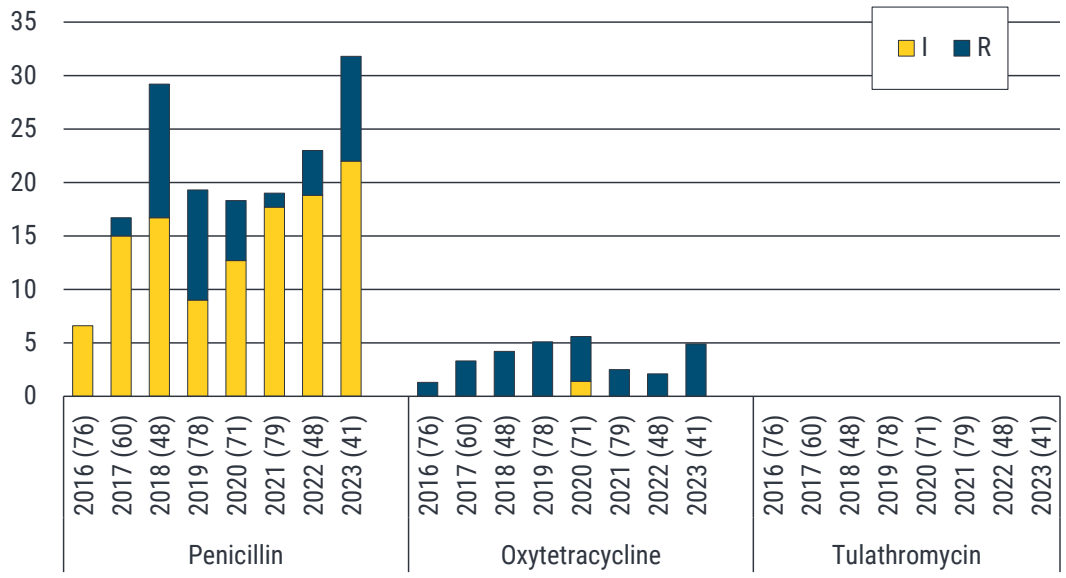


The number of tested samples are in brackets

PATHOGENS IN FOOD-PRODUCING ANIMALS

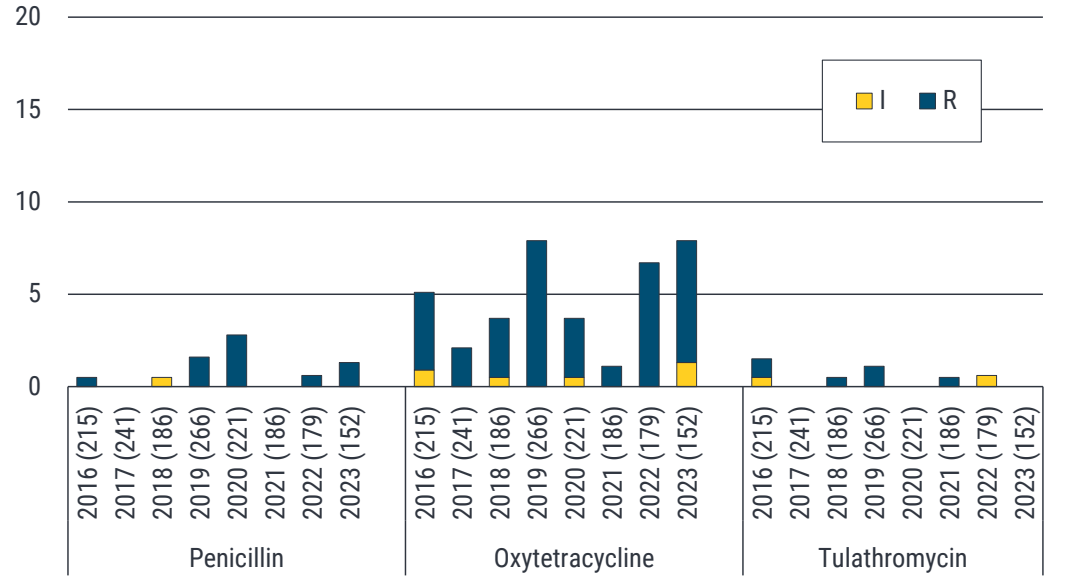
Among bovine respiratory pathogens, antibiotic susceptibilities of *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* bacteria isolated from diseased animals are reported. The proportion of resistant bacteria has remained at low level.

The proportion (%) of *M. haemolytica* from bovine respiratory disease with decreased susceptibility*



The number of bacterial isolates in each year in brackets

The proportion (%) of *P. multocida* from bovine respiratory disease with decreased susceptibility*

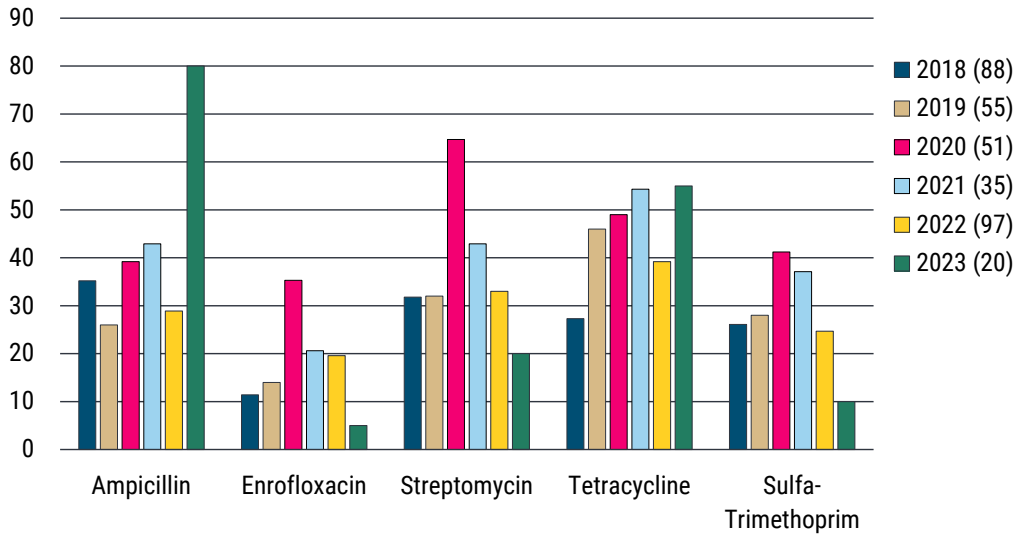


The number of bacterial isolates in each year in brackets

*Decreased susceptibility means that bacterial strains are phenotypically either resistant (R) or intermediately susceptible (I) to the antibiotic in question according to clinical breakpoints.

Among swine pathogens, the antibiotic susceptibilities of enterotoxigenic *E. coli*, *Brachyspira pilosicoli* and *Actinobacillus pleuropneumoniae* isolates from diseased animals are reported. In *B. pilosicoli* no significant changes were detected in 2023 compared to the previous years. In *A. Pleuropneumoniae* a slight increase in oxytetracycline resistance was noted. Due to small number of enterotoxigenic *E. coli*, no conclusions can be drawn regarding changes in antibiotic resistance situation. AmpC producing strains were detected in five farms, but no ESBL-*E. coli* was detected.

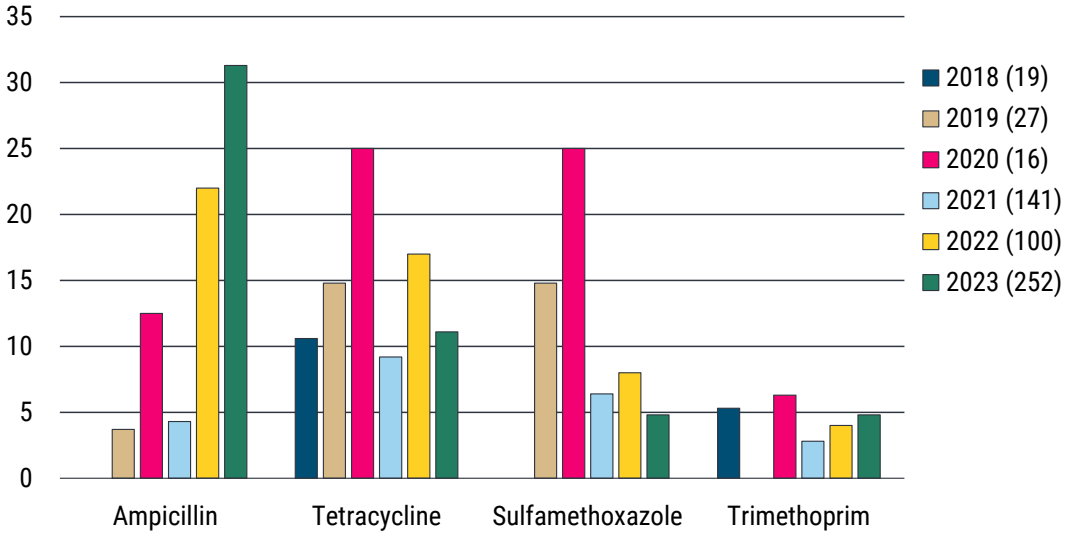
The proportion (%) of enterotoxigenic *E. coli* from porcine enteritis with decreased susceptibility*



The number of bacterial isolates in each year in brackets

Among poultry pathogens, the antibiotic susceptibilities of *E. coli* from colibacillosis cases are reported. In 2023, resistance to ampicillin increased compared to previous years. No resistance to 3rd generation cephalosporins was detected.

The proportion (%) of *E. coli* from broiler colibacillosis with decreased susceptibility*



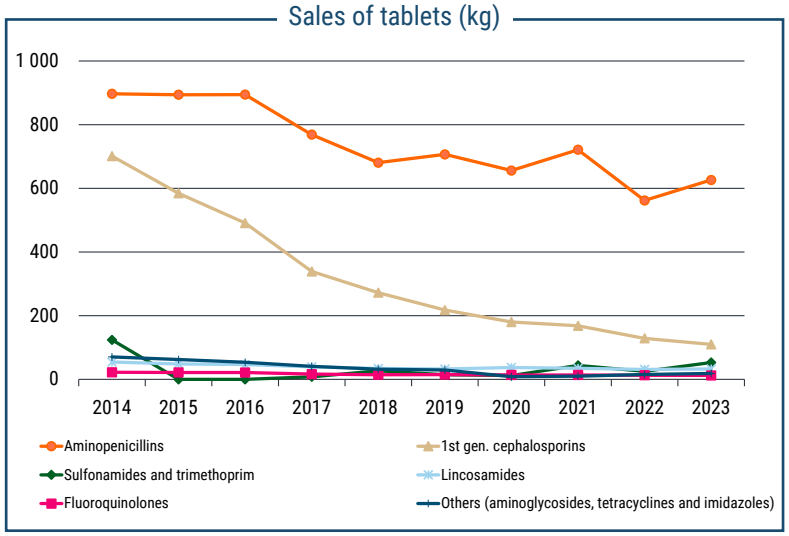
The number of bacterial isolates in each year in brackets

*Decreased susceptibility means that bacterial strains are phenotypically either resistant (R) or intermediately susceptible (I) to the antibiotic in question according to clinical breakpoints.

ANTIBIOTICS AND PATHOGENS IN COMPANION ANIMALS

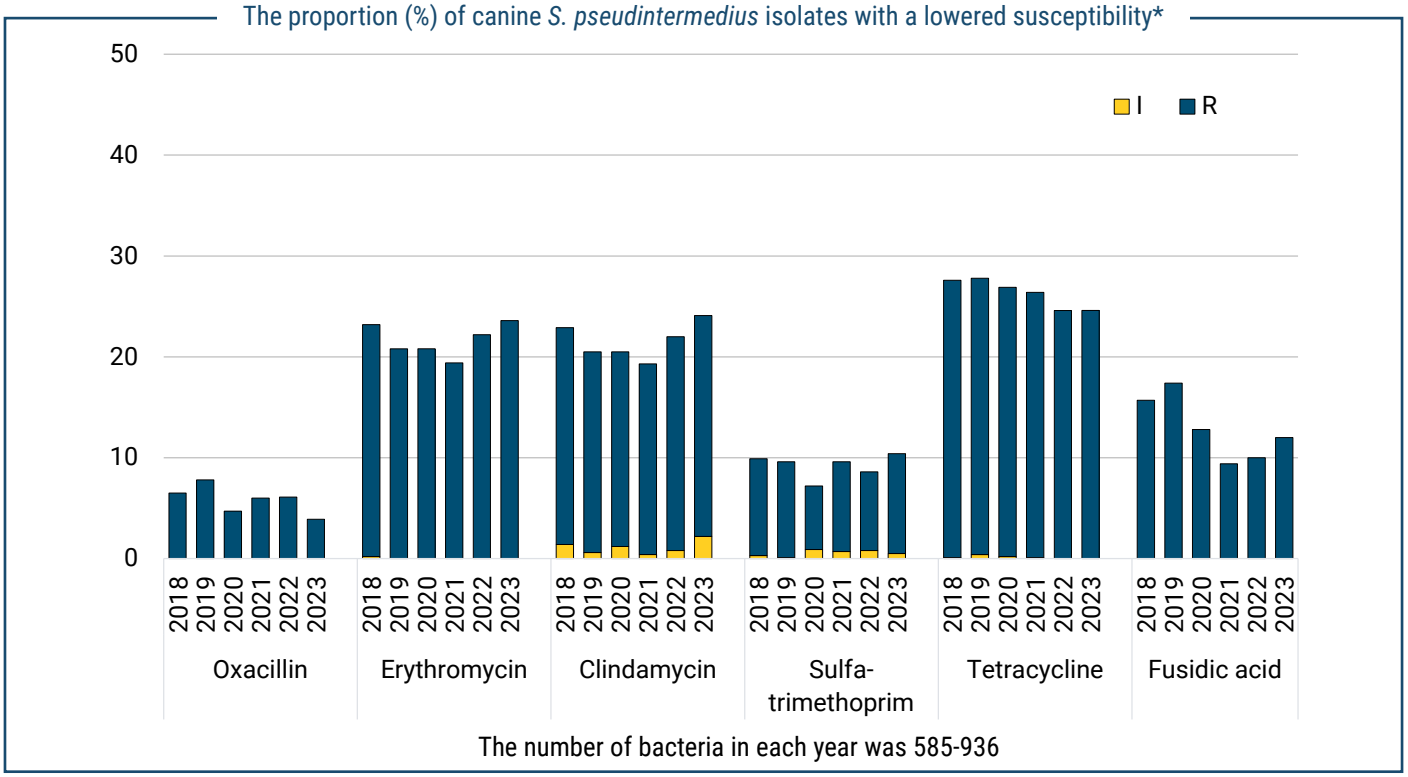
Sales of tablets

Monitoring of sales of antibiotics intended for companion animals is currently possible only for products in the form of tablets. Their sales have more than halved in ten years but increased by 10% in 2022-2023. This was mainly due to rise in sales of the most sold veterinary antibiotic tablet, amoxycillin-clavulanic acid combination. Decrease in sales of 1st generation cephalosporins and fluoroquinolones continued (-15% and -5% respectively).



The number of dogs and cats

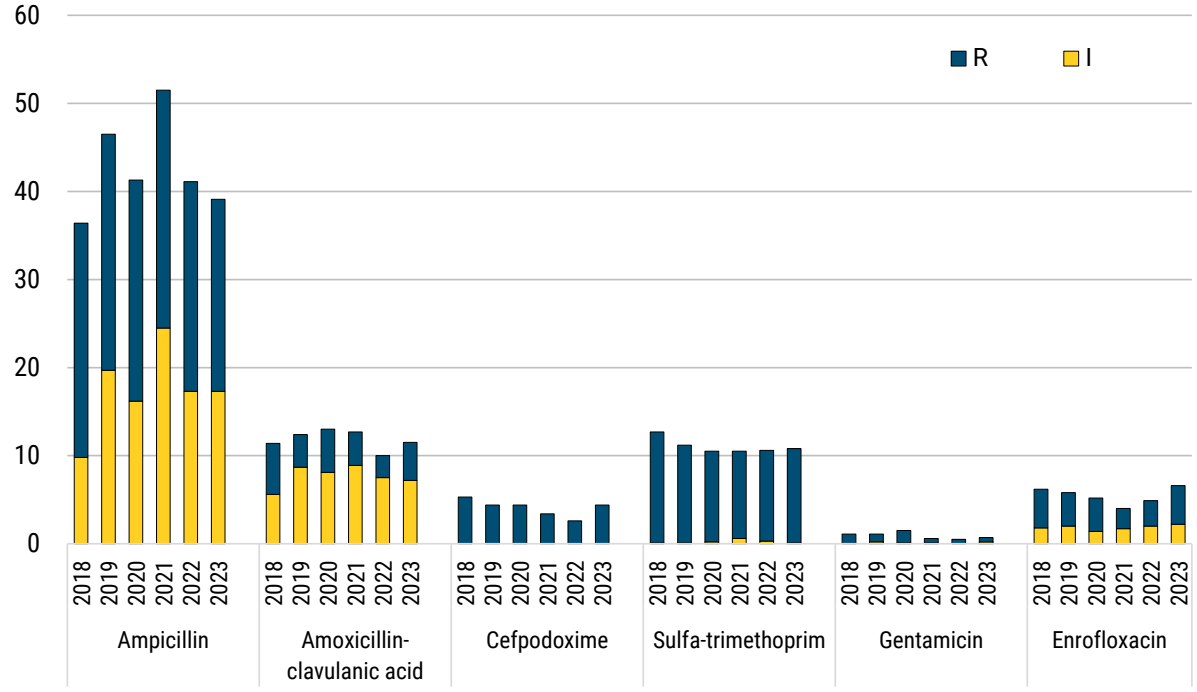
According to Statistics Finland, the number of dogs and cats in Finland in 2016 was about 700 000 and 600 000, respectively. It has been estimated that the number of companion animals increased during the Covid-19 pandemic. According to a survey commissioned by the Finnish Kennel Club, there were approximately 800 000 dogs in Finland in 2023.



*Decreased susceptibility means that bacterial strains are phenotypically either resistant (R) or intermediately susceptible (I) to the antibiotic in question according to clinical breakpoints.

The proportion of cefpodoxime resistance among canine *E. coli* has increased again, being 4.4% in 2023, after a slight decrease in 2021 and 2022. The proportion of oxacillin resistance in canine *S. pseudintermedius* has decreased, being 3.9% in 2023.

The proportion (%) of canine *E. coli* isolates with a lowered susceptibility*



The number of bacteria in each year was 821-1 265

*Decreased susceptibility means that bacterial strains are phenotypically either resistant (R) or intermediately susceptible (I) to the antibiotic in question according to clinical breakpoints.