FINRES-Vet 2021

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

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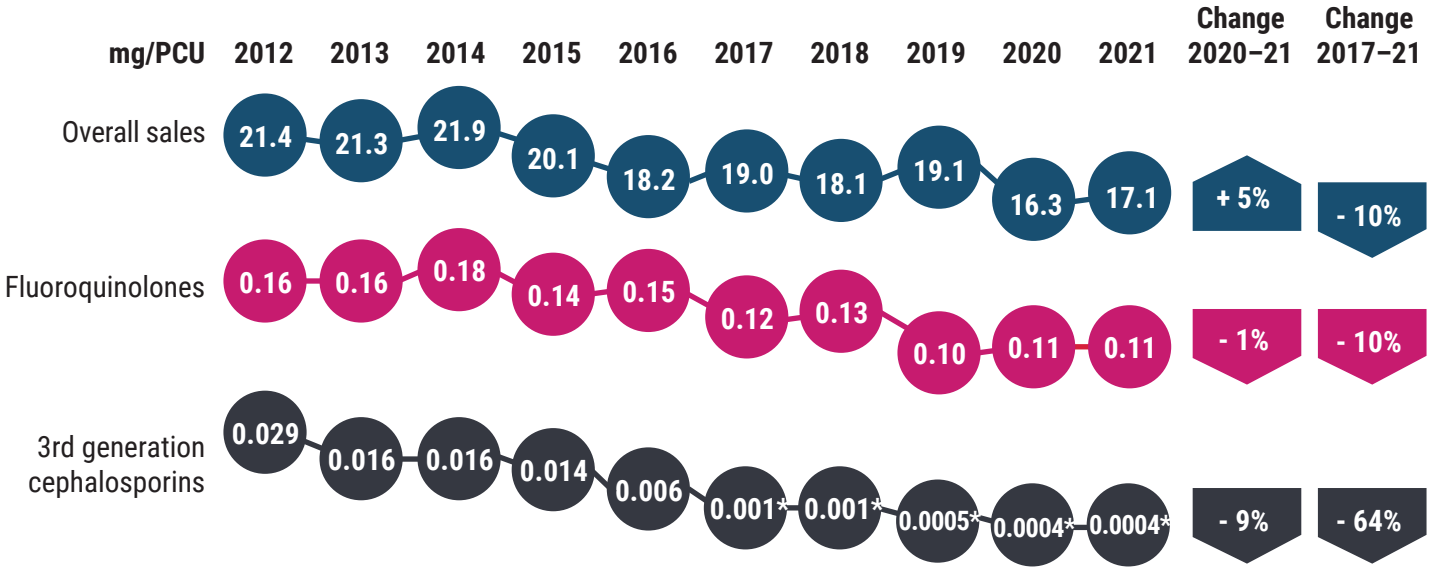
UNIVERSITY OF HELSINKI

Co-funded by the European Union

ANTIBIOTICS FOR FOOD-PRODUCING ANIMALS

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

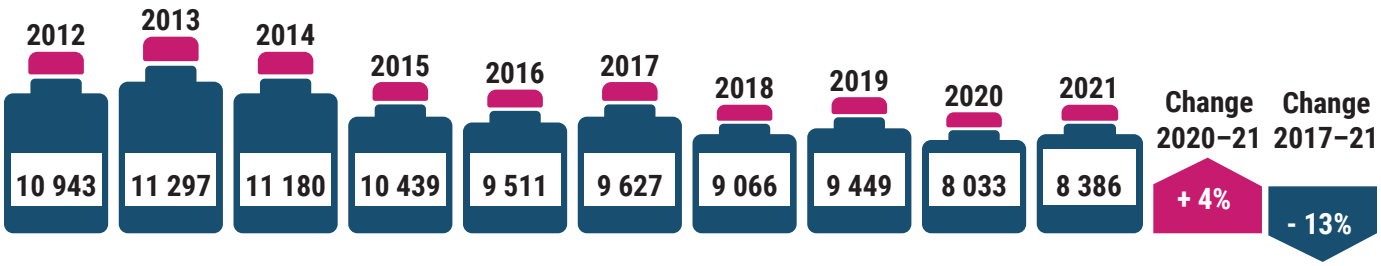
Population adjusted sales of veterinary antibiotics increased by 5% in 2021. Nevertheless, the sales 17.1 mg/PCU was the second lowest ever reported. Sales of critically important antibiotics for human medicine continued to decrease.



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

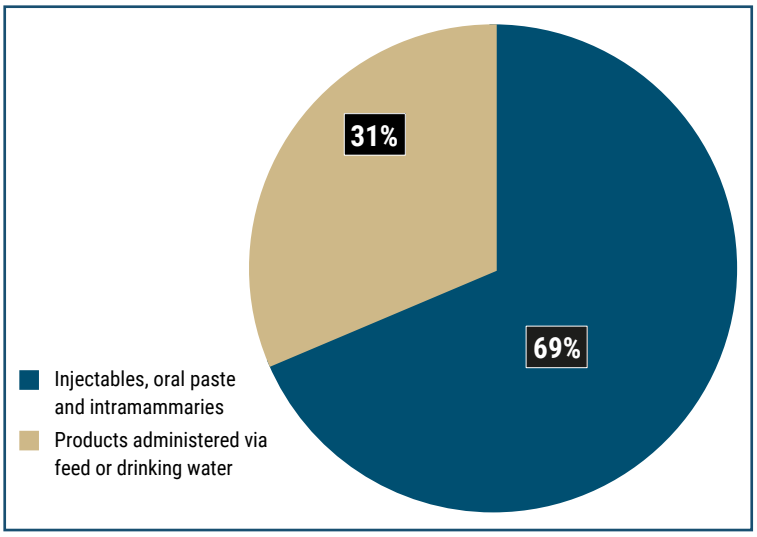
Total sales (kg active ingredient)

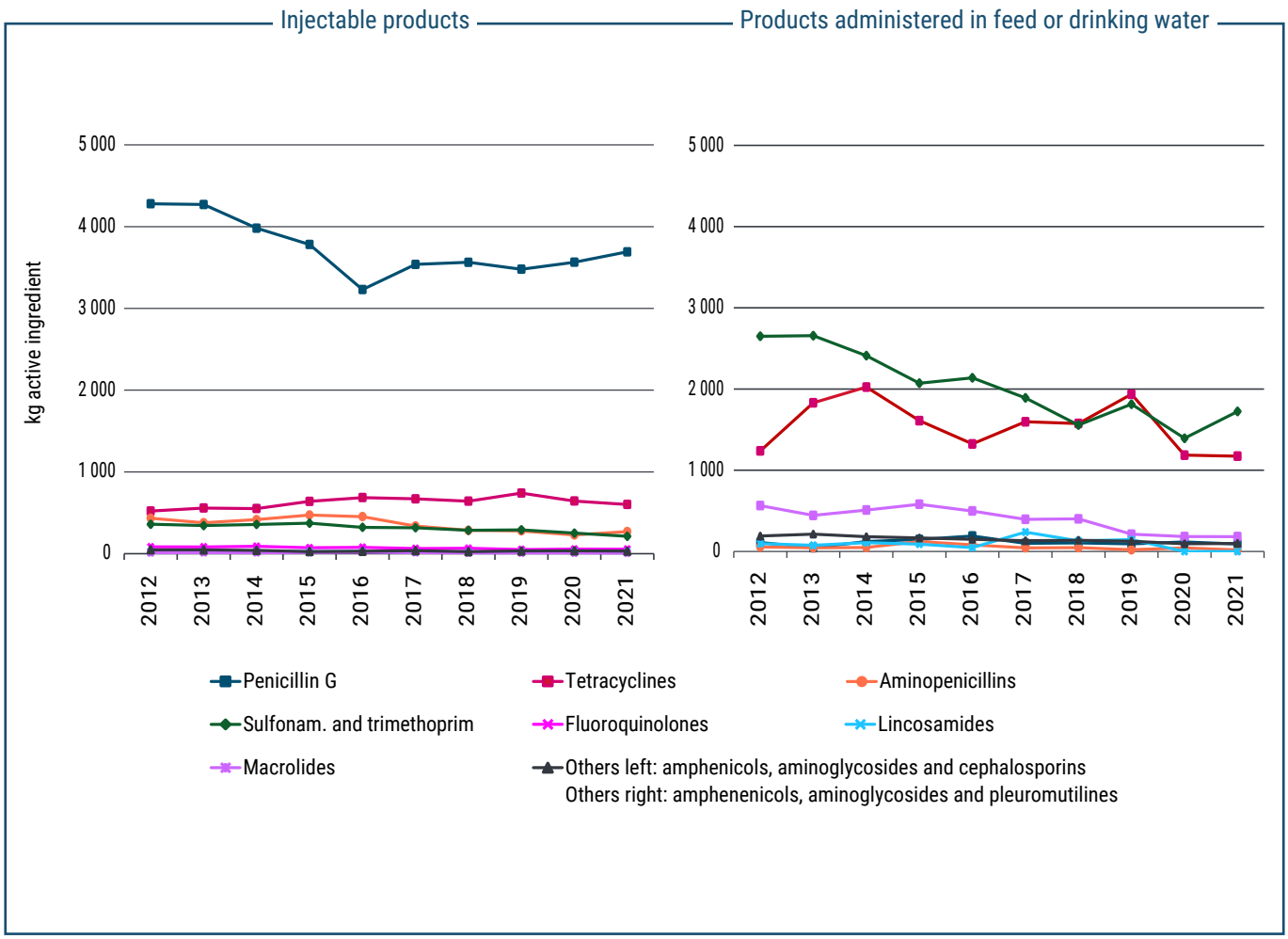
Total sales for use in food-producing animals increased in 2021 by 4% in comparison to 2020 but was over 13% lower than five years before. On international comparison, antibiotic use in Finland continues to be modest and prudent both considering EU-indicators and total sales.



Sales by administration route (kg active ingredient)

Two thirds of the antibiotics for food-producing animals were products intended for treatment of individual animals (injectables, oral paste, intramammaries). The remaining one third was antibiotics administered via feed or drinking water to groups of animals. By far the most used antibiotic was injectable penicillin followed by sulfonamide-trimethoprim combination and tetracyclines.

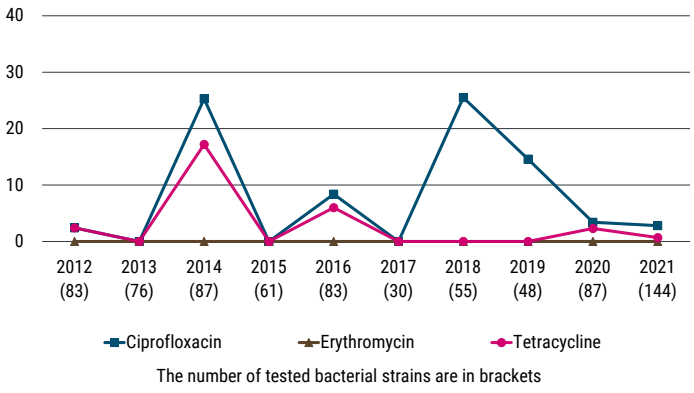




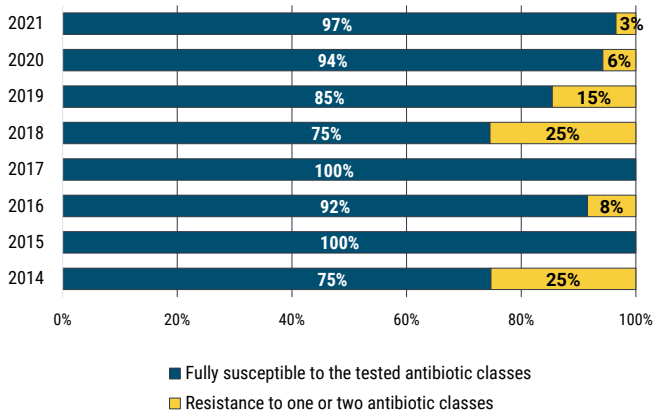
CAMPYLOBACTER IN FOOD-PRODUCING ANIMALS

The majority of campylobacter isolates from the national control programme have been fully susceptible to all of the tested antibiotics. Resistance to quinolones and tetracycline has varied from 2014. Strains concurrently resistant to three or more antimicrobial classes (multidrug resistance) have not been detected.

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

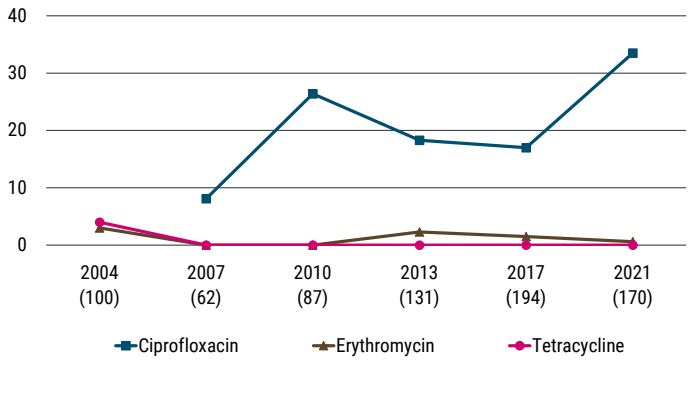


Antibiotic susceptibillity in *C. jejuni* from broilers

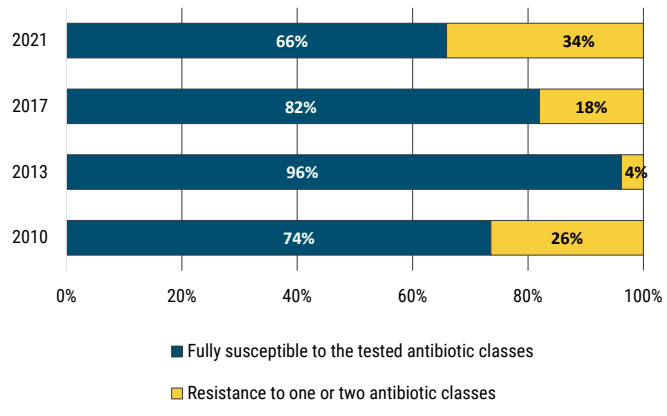


Campylobacter coli isolates from pigs have shown significant resistance only to fluoroquinolone antibiotics. In 2021, already every third tested strain was resistant to ciprofloxacin, which is more than in previous monitoring years.

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



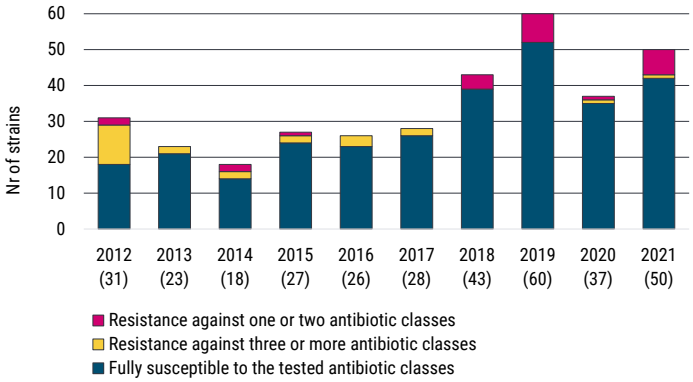
Antibiotic susceptibility in *C. coli* from pigs



SALMONELLA IN FOOD-PRODUCING ANIMALS

Salmonella bacteria 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.

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

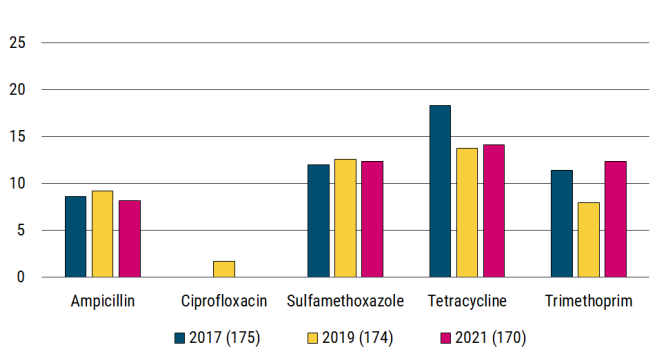


The number of tested bacterial strains are in brackets.

INDICATOR BACTERIA IN FOOD-PRODUCING ANIMALS

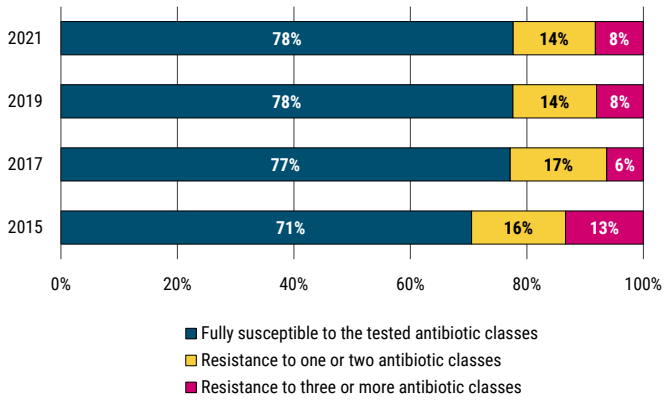
The majority of indicator *E. coli* isolates from pigs is fully susceptible to the tested antibiotic classes. Resistance is mostly detected against tetracycline, sulfamethoxazole, trimethoprim and ampicillin. The proportion of multidrug-resistance was 8% in 2021.

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



The number of tested bacterial strains are in brackets.

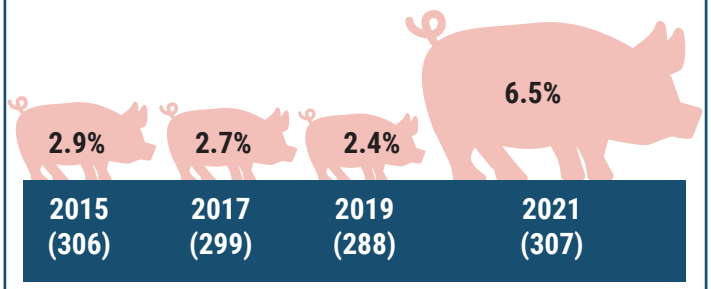
Antibiotic resistance in indicator *E. coli* from pigs



ESBL BACTERIA IN FOOD-PRODUCING ANIMALS AND MEAT

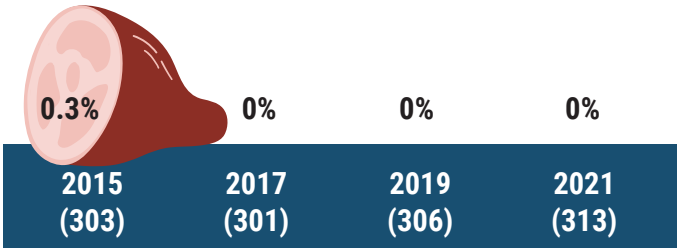
The prevalence of ESBL- and AmpC-producing *E. coli* in pigs at slaughter was higher than in previous years. In pork and beef samples taken at retail ESBL- and AmpC findings have been rare. Carbapenemase-producing *E. coli* have not been found.

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



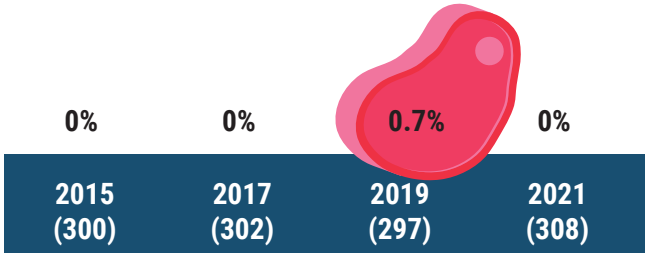
The numbers of tested samples are in brackets

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



The numbers of tested samples are in brackets

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

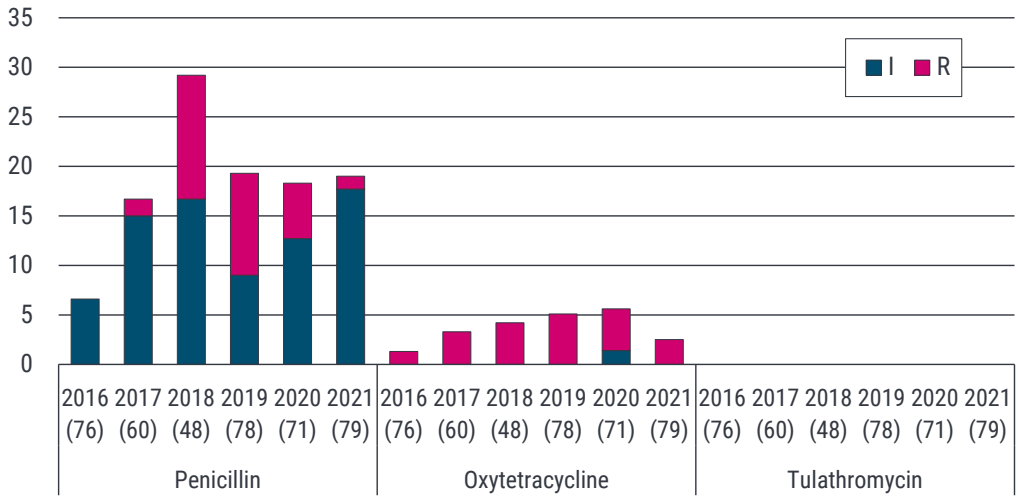


The numbers of tested samples are in brackets

PATHOGENS IN FOOD-PRODUCING ANIMALS

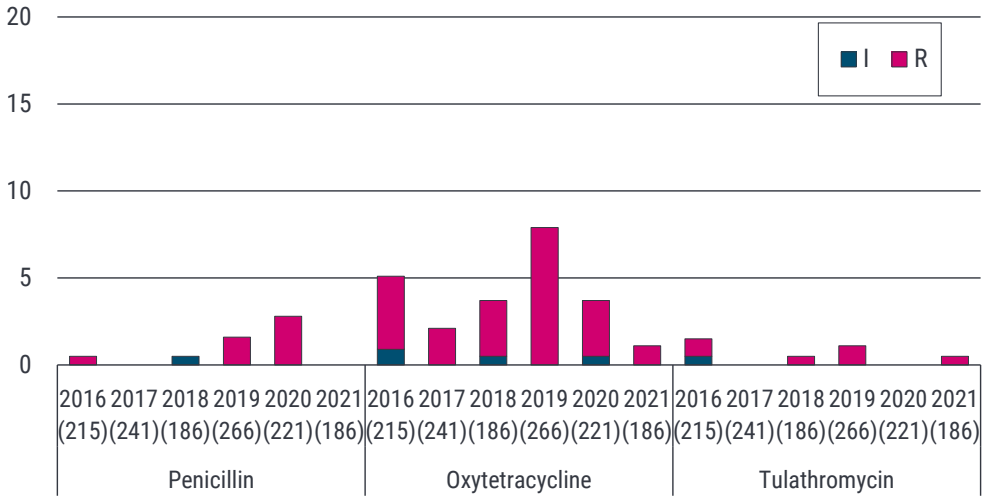
Among bovine respiratory pathogens, antibiotic susceptibilities of *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* bacteria isolated from diseased animals are reported. The proportion of resistant bacterial isolates was lower than in previous years.

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*

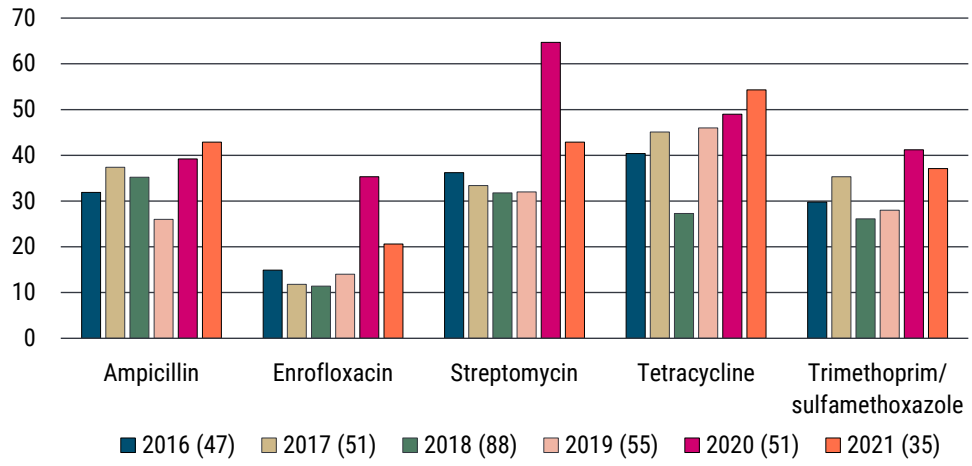


The number of bacterial isolates in each year in brackets

*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* and *A. pleuropneumoniae*, no significant changes were detected in 2021 compared to the previous years. In enterotoxigenic *E. coli*, resistance to several antibiotics was common as in previous years and multidrug resistance was still found in a large proportion of the strains. AmpC producing strains were detected in three farms but no ESBL-*E. coli* was detected.

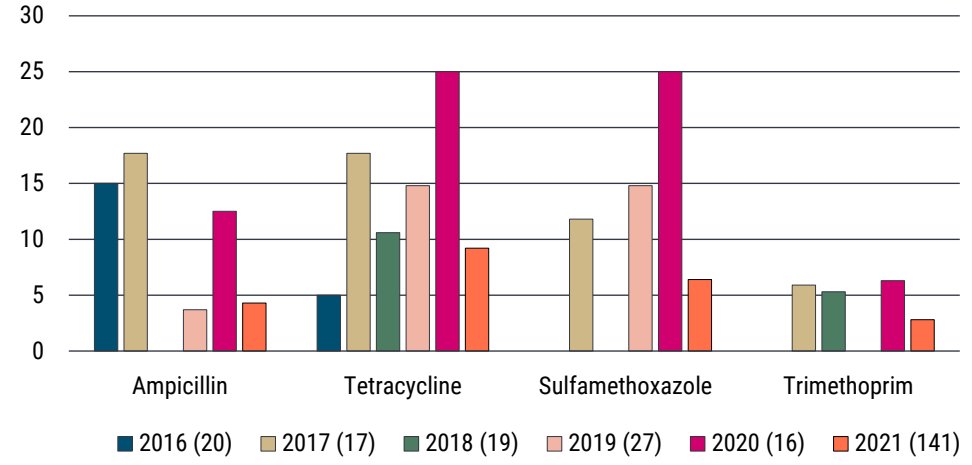
The proportion (%) of enterotoxigenic *E. coli* from porcine enteritis with decreased susceptibility*



The number of bacterial isolates in each year in brackets

Among poultry pathogens, the antibiotic susceptibilities of *E. coli* from colibacillosis cases and *Staphylococcus aureus* from arthritis and tenosynovitis are reported. In 2021, no resistance to the tested antibiotics was detected in *S. aureus* strains when clinical breakpoints were applied. In *E. coli*, no resistance to fluoroquinolones or 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

Monitoring of sales of antibiotics intended for companion animals is currently possible only for tablet products.

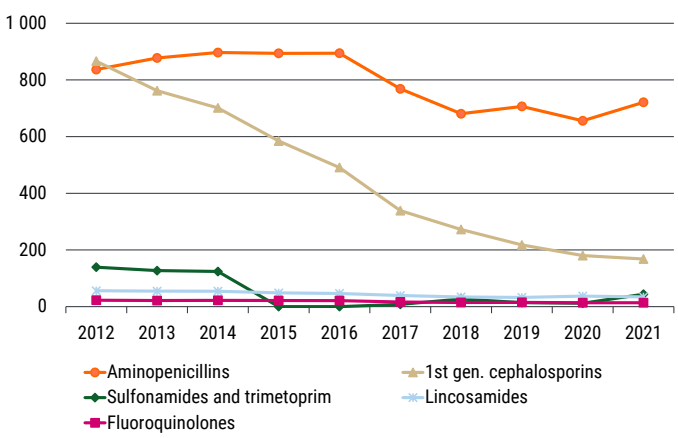
The number of dogs and cats

According to Statistics Finland, the number of dogs and cats in Finland was about 700 000 and 600 000, respectively, in 2016. It has been estimated that during COVID-19 pandemic the number of companion animals increased, but official statistics are not available.

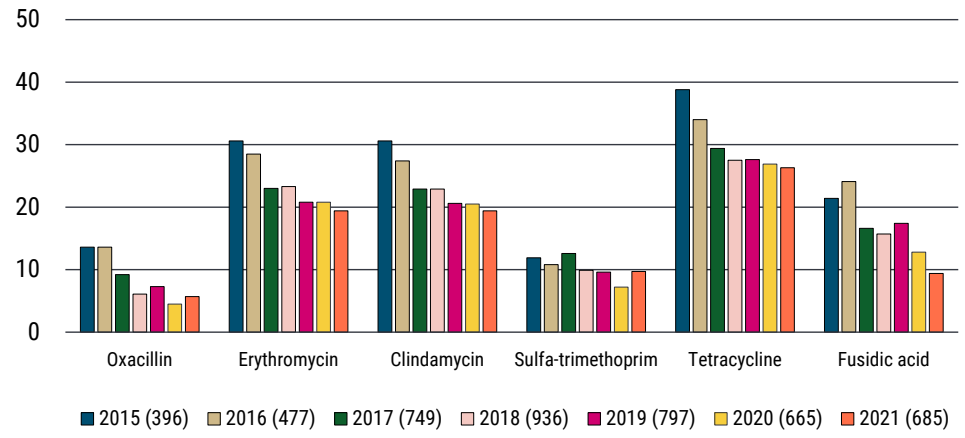
Sales of tablets

A decreasing trend in the sales of tablets for companion animals during the last decade turned to a 10% increase. The by far most sold antibiotic for companion animals is amoxycillin, sales of which was 10% higher in 2021 than the year before. Increased sales of tablets can at least partially be explained by the improved availability of antibiotic tablets. Sales of first generation cephalosporins continued to decrease.

Sales of tablets (kg)

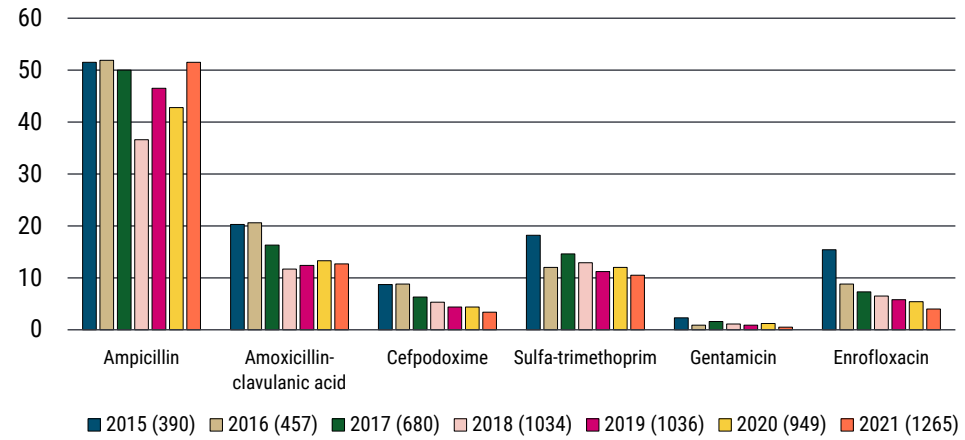


The proportion (%) of canine *S. pseudintermedius* isolates with decreased susceptibility*



The yearly number of bacterial isolates in brackets

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



The yearly number of bacterial isolates in brackets

The proportion of ESBL among canine *E. coli* has decreased steadily from 2015 being only 0.4% in 2021.

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