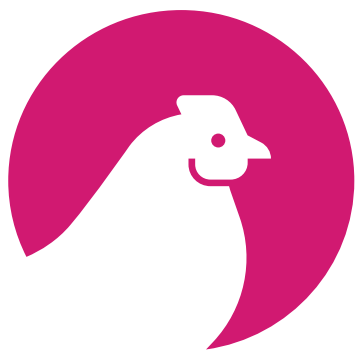


FINRES-Vet 2019

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

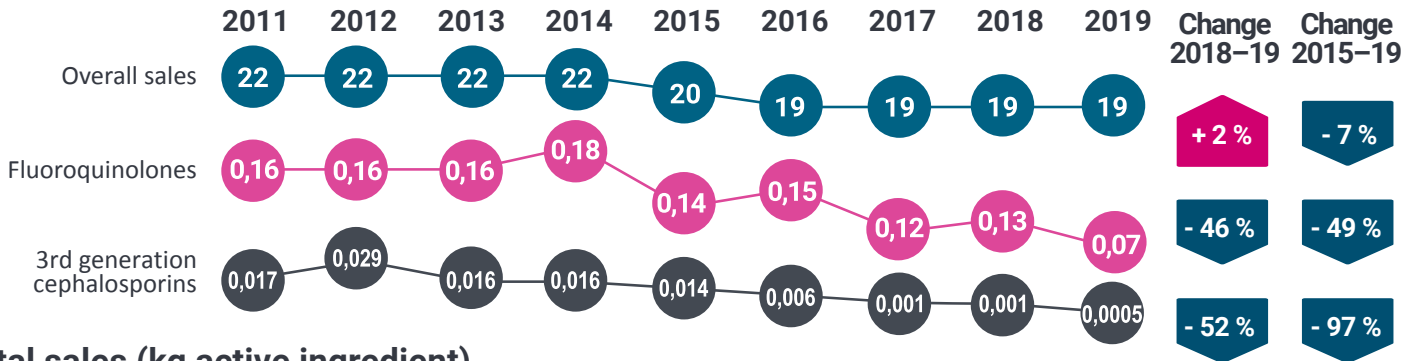


HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

ANTIMICROBIALS FOR FOOD-PRODUCING ANIMALS

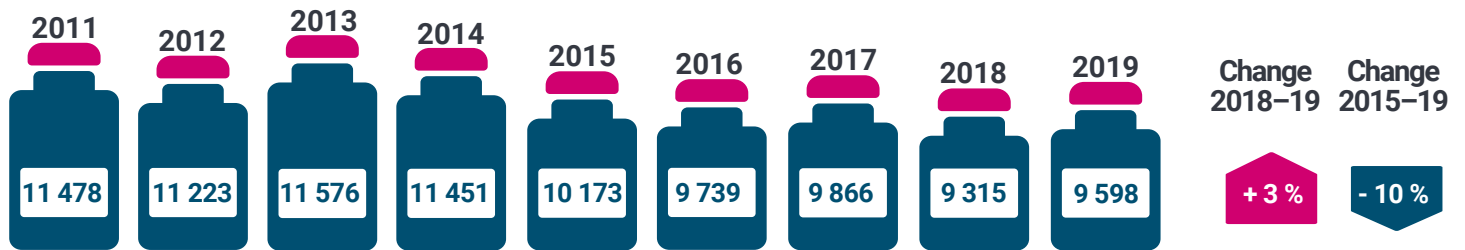
EU indicators (mg/PCU)

Overall sales of population adjusted veterinary antimicrobials in Finland is very low, despite increase of 2% compared to year 2018. Sales of reserve antimicrobials was also very low: decrease in sales of 3rd generation cephalosporins continued and sales of fluoroquinolones halved from 2018.



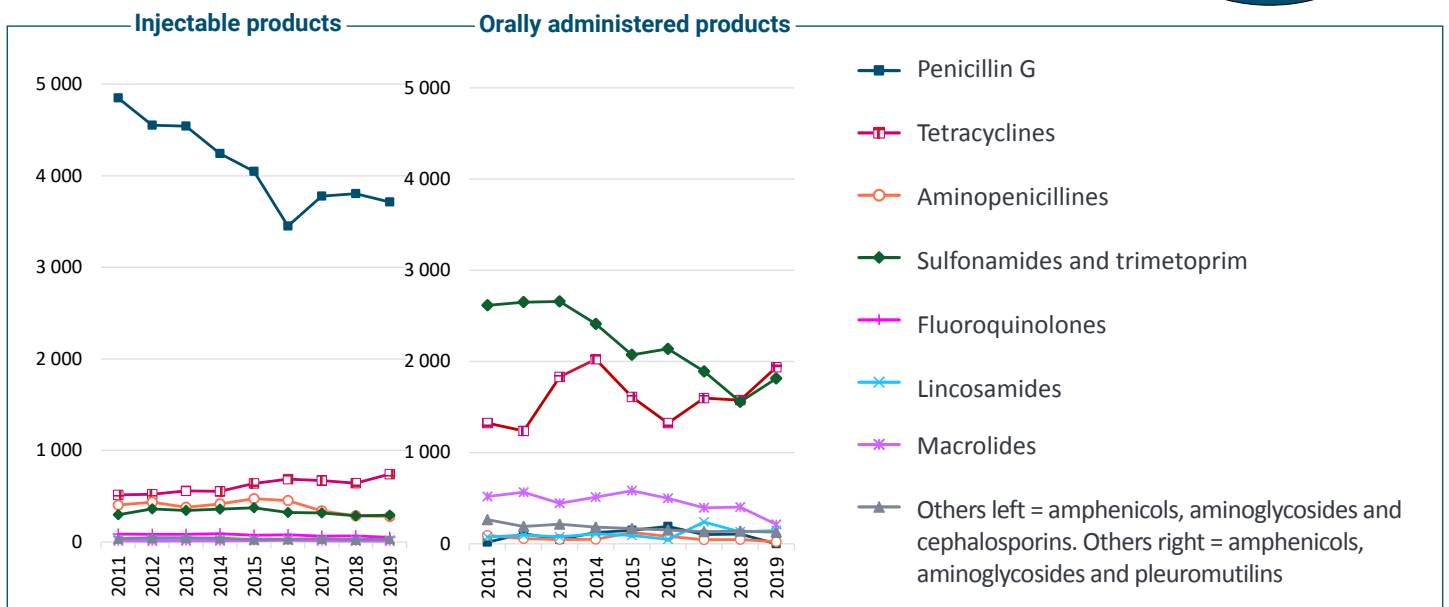
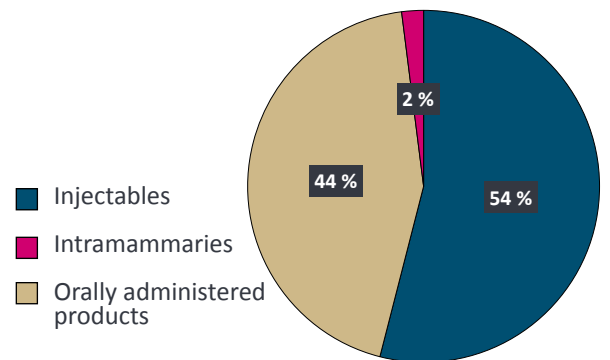
Total sales (kg active ingredient)

Total sales of veterinary antimicrobials have decreased markedly during this decade, but slightly increased in 2019.



Sales by administration route (kg active ingredient)

Over half of antimicrobials are administered as individual treatment to food-producing animals (injectables and intramammaries). By far the most sold antimicrobial is injectable penicillin, though its sales have clearly decreased in 2010's. Next most sold are orally administered tetracyclines and the combination of sulfonamides and trimethoprim sales of these both groups increased in 2019.



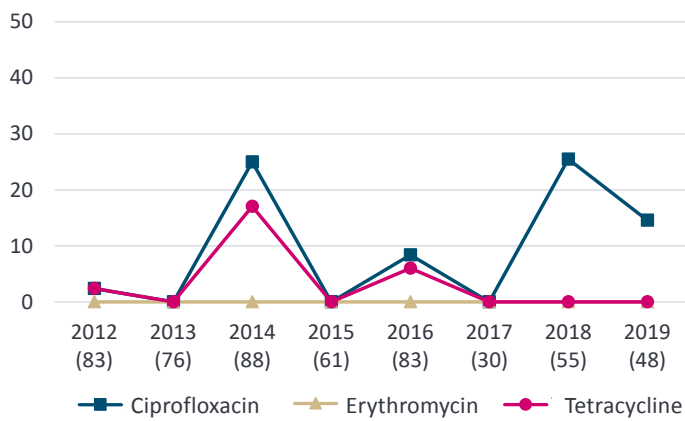
ZOONOTIC AND INDICATOR BACTERIA IN FOOD-PRODUCING ANIMALS



The majority of campylobacter isolates from the national control programme are fully susceptible to the tested antimicrobials.

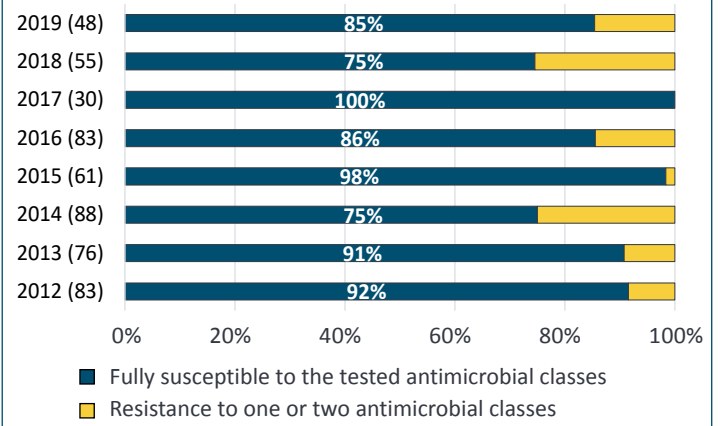
Resistance to quinolones and tetracycline has varied from 2014. Strains concurrently resistant to three or more antimicrobial classes (multidrug resistance) have not been detected.

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



The number of bacteria in each year in brackets.

Antimicrobial resistance in *C. jejuni* from broilers

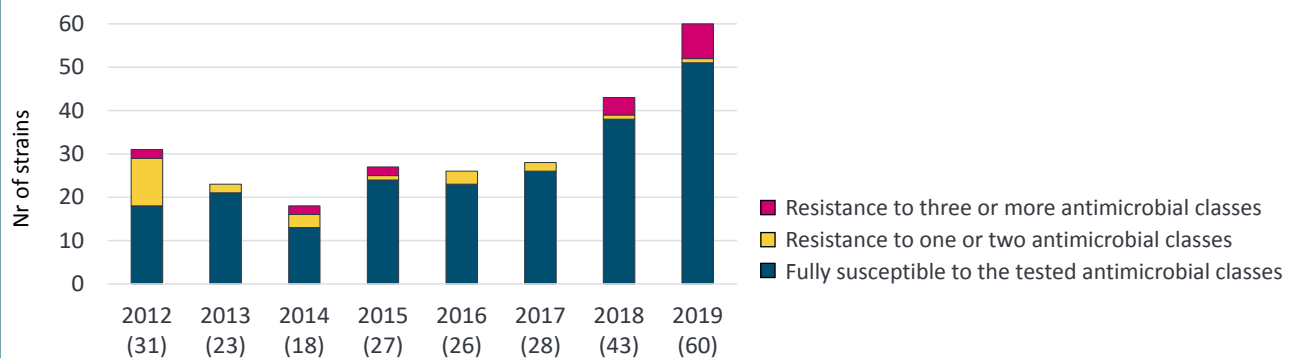


The number of bacteria in each year in brackets.

Salmonella bacteria isolated from Finnish food-producing animals have mostly been susceptible to the tested antimicrobial classes.

In 2019, multiresistant monophasic *Salmonella Typhimurium* was discovered for the first time. This bacteria was found in two calf rearing units, one piglet producing farm and four pig fattening farms.

Detected salmonella bacteria and their resistance from the Finnish food-producing animals



The number of bacteria in each year in brackets.

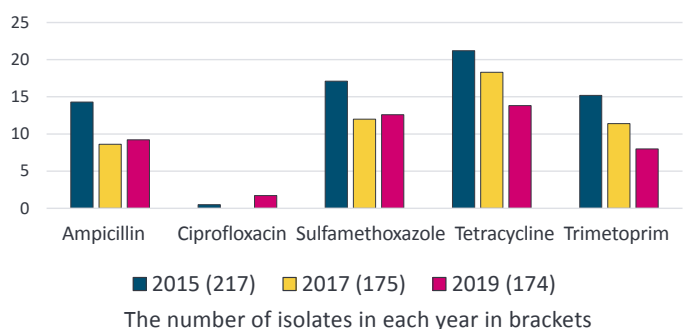
ZONOTIC AND INDICATOR BACTERIA IN FOOD-PRODUCING ANIMALS



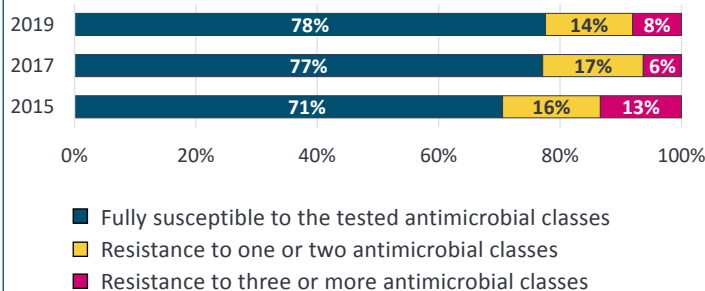
The majority of indicator *E. coli* from pigs were fully susceptible to the tested antimicrobial classes.

Resistance was mostly detected against tetracycline, sulfamethoxazole, ampicillin and trimethoprim. The proportion of multiresistant bacteria was 8 %.

Resistance in indicator *E. coli* from pigs to selected antimicrobials in 2015, 2017 and 2019 (%)



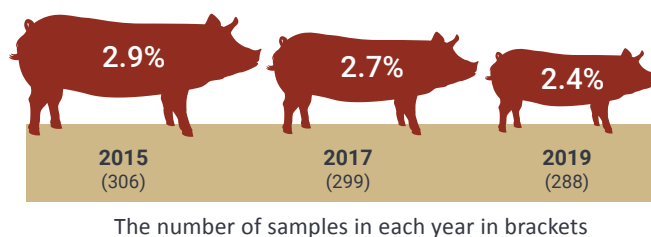
Antimicrobial resistance in indicator *E. coli* from pigs (%)



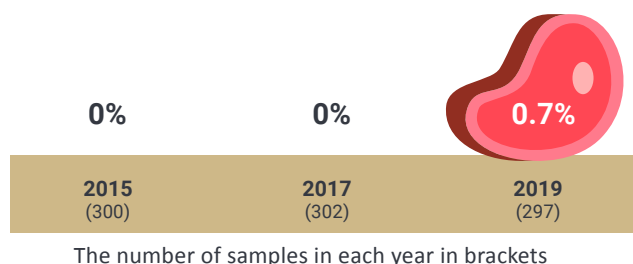
ESBL/AmpC-producing *E. coli* in pigs, pork and beef

The prevalence of ESBL- and AmpC-producing *E. coli* bacteria in pigs has been low (2–3%). AmpC has been the most prevalent enzyme type. ESBL/AmpC findings have been rare in pork and beef samples taken at retail (<1%). Carbapenemase-producing *E. coli* have not been found.

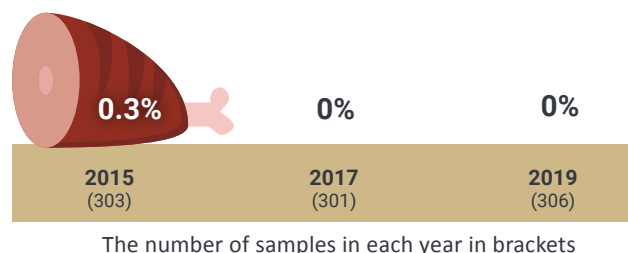
ESBL/AmpC-producing *E. coli* in pigs at slaughter



ESBL/AmpC-producing *E. coli* in fresh bovine meat, at retail



ESBL/AmpC-producing *E. coli* in fresh meat from pigs, at retail



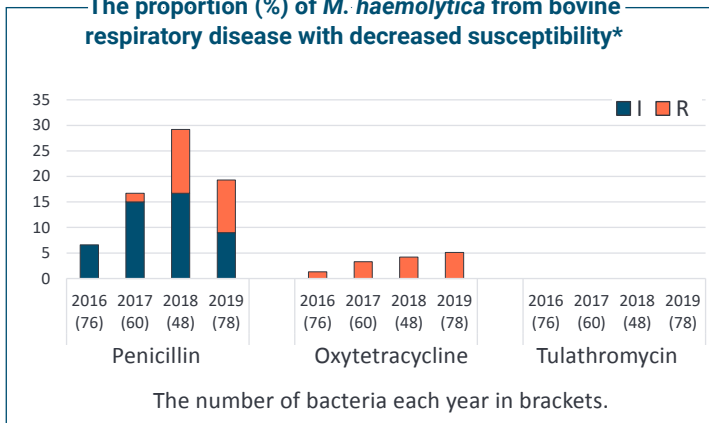
PATHOGENS IN FOOD-PRODUCING ANIMALS



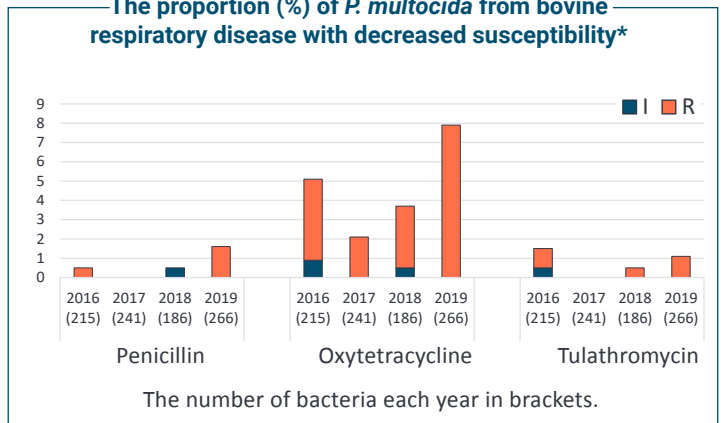
Cattle

Among bovine respiratory pathogens, the antimicrobial susceptibilities of *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni* bacteria isolated from diseased animals are reported. In *P. multocida*, oxytetracycline resistance seems to be increasing. In *M. haemolytica*, a trend towards increasing oxytetracycline resistance is seen, however, the proportion of isolates with decreased susceptibility to penicillin has decreased during 2019.

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



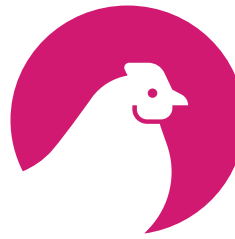
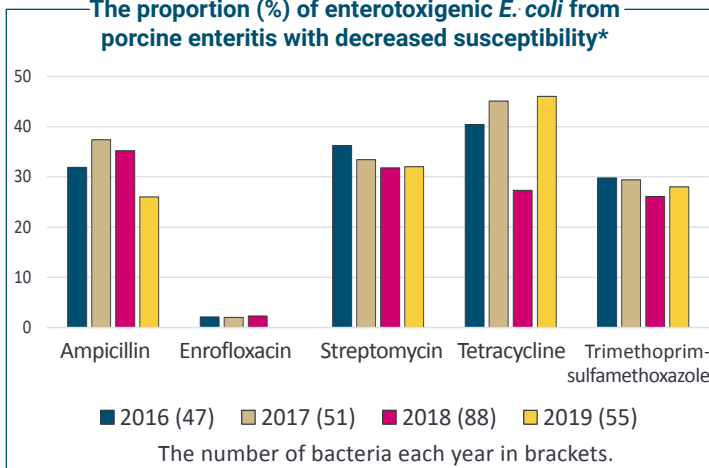
The proportion (%) of *P. multocida* from bovine respiratory disease with decreased susceptibility*



Swine

Among swine pathogens, the antimicrobial 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 2019 compared to the previous years. In enterotoxigenic *E. coli*, resistance to several antimicrobials was common as in previous years: multidrug resistance was detected in 17 isolates from 12 farms. AmpC producing *E. coli* was detected in one farm but no ESBL-producers were detected.

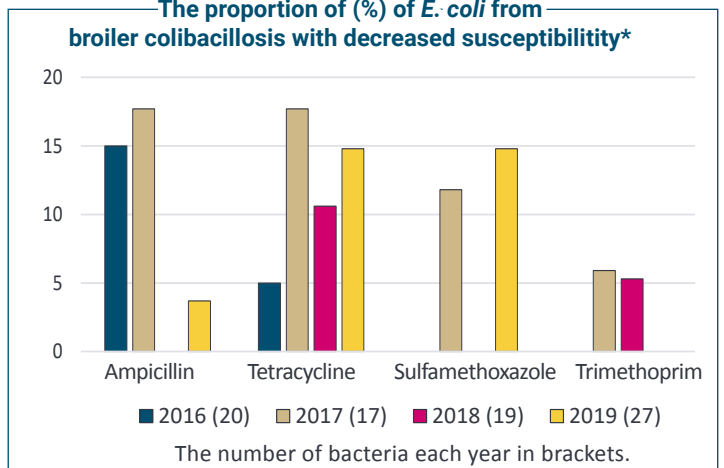
The proportion (%) of enterotoxigenic *E. coli* from porcine enteritis with decreased susceptibility*



Broiler

Among poultry pathogens, the antimicrobial susceptibilities of *E. coli* from colibacillosis cases and *Staphylococcus aureus* from arthritis and tenosynovitis are reported. In 2019, no resistance to the tested antimicrobials 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 (%) of *E. coli* from broiler colibacillosis with decreased susceptibility*



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

COMPANION ANIMALS



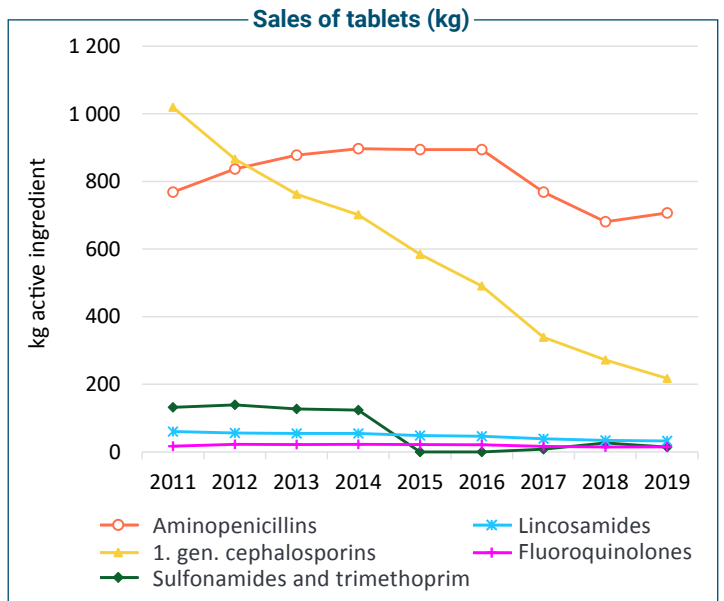
The number of dogs and cats

Statistics Finland estimated that there were 630 000 dogs and 592 000 cats in Finland in 2012. In the latest estimate year 2016 number of dogs was 630 000

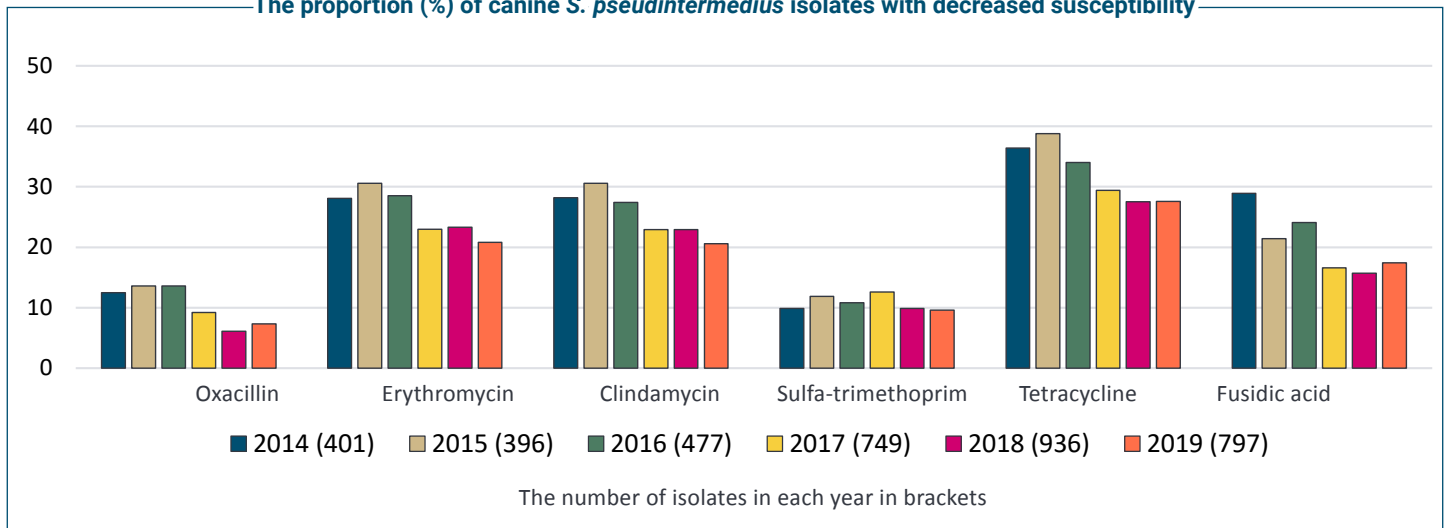
and of cats 600 000.

Sales of tablets

Sales of tablets intended for companion animals have halved during the 2010's. Sales of 1st generation cephalosporins in 2019 were almost 80% less than in 2011. Sales of aminopenicillins and fluoroquinolones increased slightly in 2019.



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



Among *E. coli* in dogs, the proportion of ESBL findings has decreased steadily from 2015 and was only 0.9% in 2019.

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

