ECA 2023

The 3rd International Electronic Conference on Antibiotics
Rise of Antibiotic Resistance: Mechanisms Involved
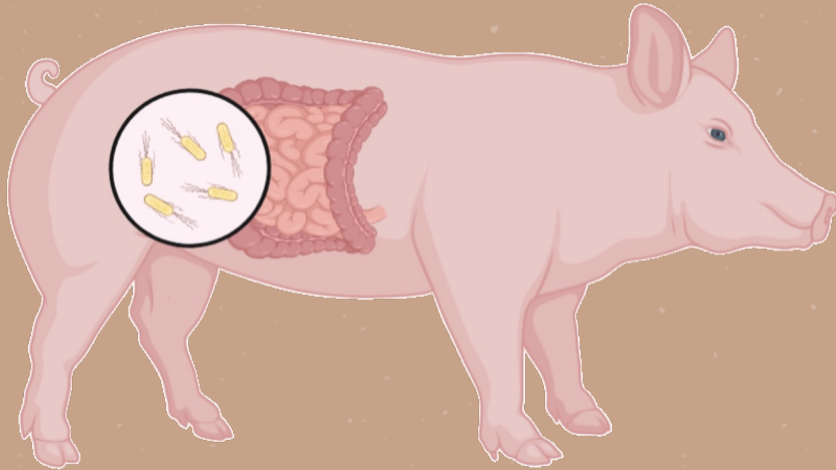and Solutions to Tackle it
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Escherichia coli and Antibiotic Resistance in Swine Farming: Implications for Public Health

Adriana Silva, Vanessa Silva, Rui Cordeiro, Patrícia Valentão, Virgílio Falco, Gilberto Igrejas, Manuela Caniça and Patrícia Poeta

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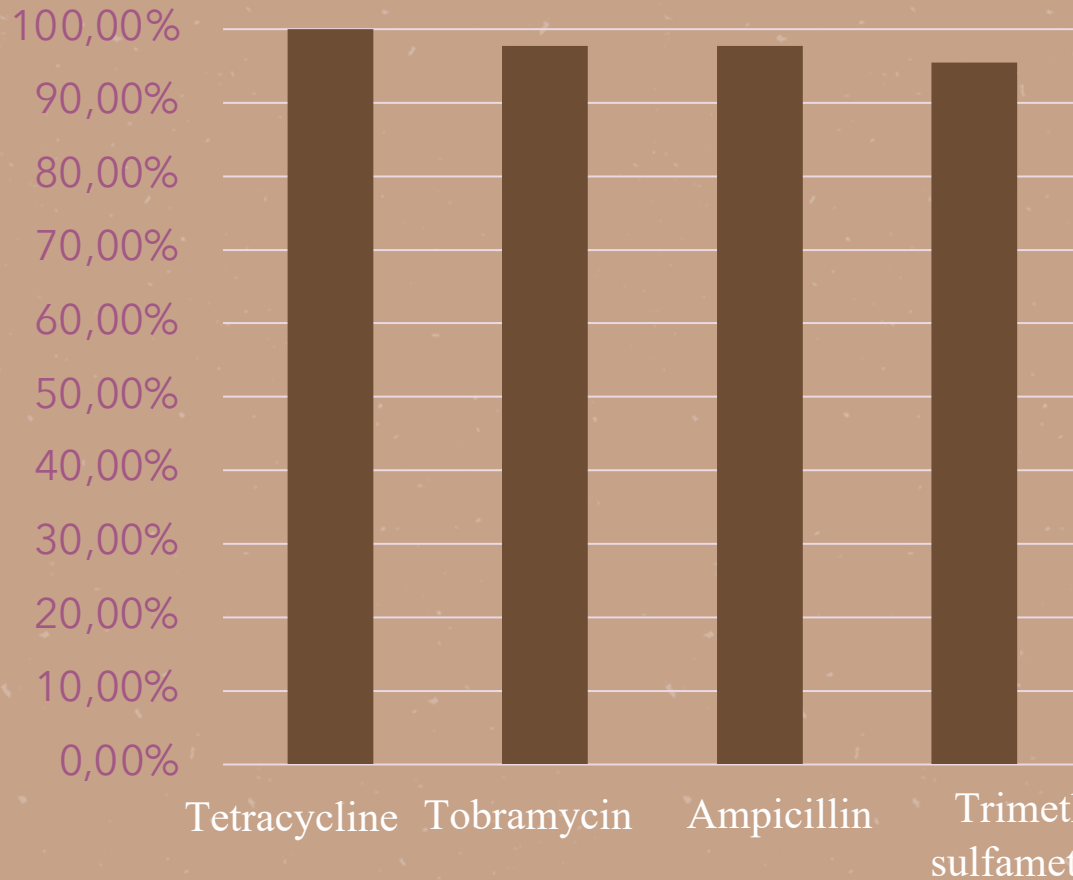and Solutions to Tackle it
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Swine farming and *E.coli*

In swine farming, *E. coli* plays a critical role in transmitting multi-drug resistance (MDR). Antibiotic use in swine management promotes antibiotic-resistant bacteria emergence, limiting treatment options and spread through food-chain.
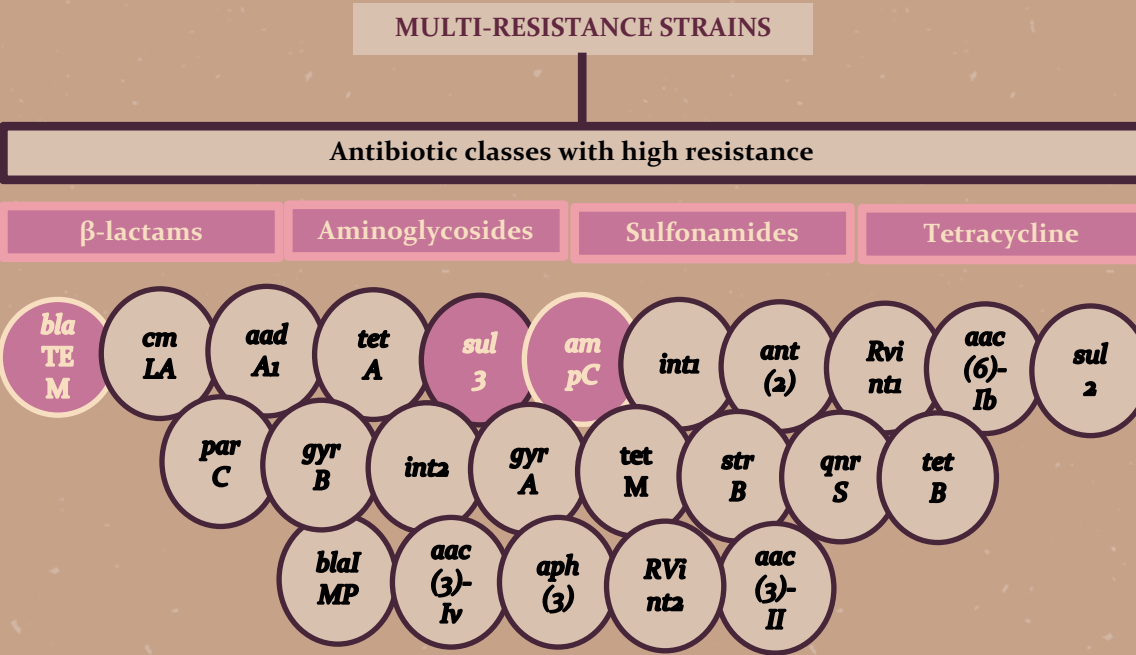
The aim of this study is investigating the role of E. coli, focusing on MDR, genotypic analysis, Multi-Locus Sequence Typing (MLST), and phylogenetic analysis from different pig farms.

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Results

- Fifty-nine swine fecal samples were obtained from 12 pig farms, yielding 47 *E. coli* isolates. Of these, 44 were from breeding pigs, distributed as different compartments. Eight samples from fattening pigs yielded two *E. coli* strains.

- Antibiotic resistance was observed in all 46 *E. coli* isolates tested, with high resistance to tetracycline (100%), ampicillin (97.8%), tobramycin (97.8%), and trimethoprim-sulfamethoxazole (95.7%).
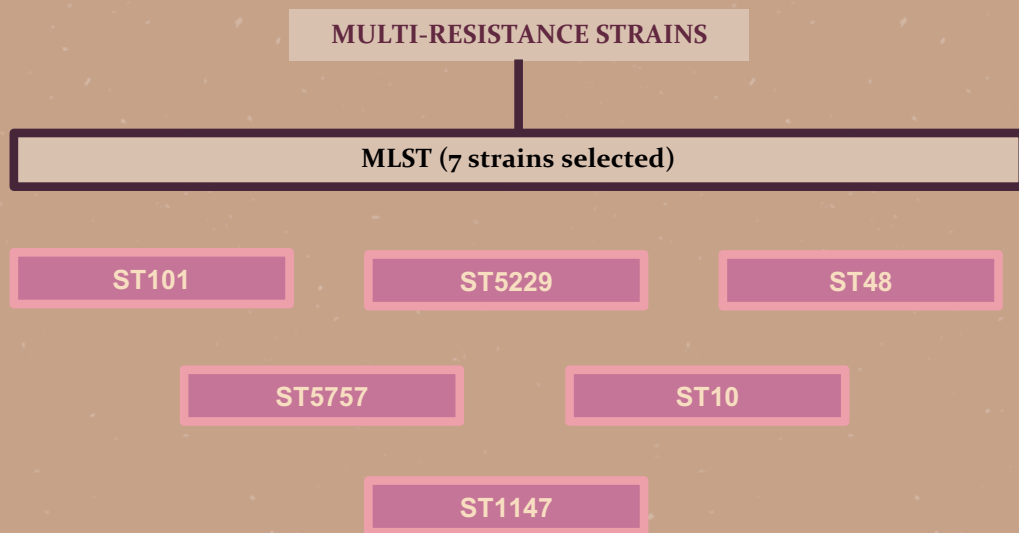
Results

MULTI-RESISTANCE STRAINS

Antibiotic classes with high resistance

β-lactams | Aminoglycosides | Sulfonamides | Tetracycline

blaTEM | cmLA | aadA1 | tetA | sul3 | ampC | int1 | ant(2) | Rvint1 | aac(6)-Ib | sul2 | parC | gyrB | int2 | gyrA | tetM | strB | qnrS | tetB | blaIMP | aac(3)-Iv | aph(3) | RVint2 | aac(3)-II

- MDR was common, with 9 isolates resistant to four antibiotic classes, 18 to five, 13 to six, and 6 to seven classes. In genotypic analysis, ampC gene was predominant (86.95%), followed by blaTEM (60.86%), sul3 (60.86%).
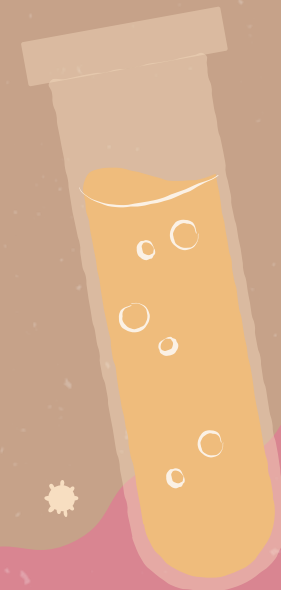
For MLST, we selected 7 strains resulting in the identification of 6 STs: ST101, ST5229, ST48, ST5757, ST10, and ST1147. Phylogroup A dominated at 60.8%, followed by B1 at 30.4%, and D at 8.69%.

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ST5229

ST48

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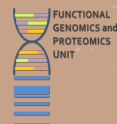
Conclusions
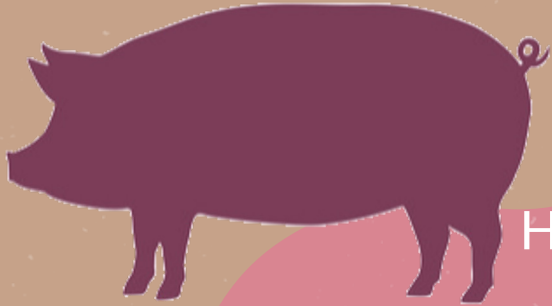
High rates of resistance were observed and MDR was widespread, with resistant to multiple antibiotic classes. Overall, this study highlights the urgent need for surveillance and intervention strategies to mitigate the transmission of antibiotic-resistant *E. coli* from swine to humans, protecting both animal and public health in the context of swine farming practices.

Thank you for your attention!