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Extended-spectrum β-lactamase-encoding genes in the pig production chain in Brazil

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INTRODUCTION & AIM

✓ Animal husbandry is a key promoter of antibiotic resistance (AMR).

Brazil ranks fourth in pork production and export.

✓ The emergence of extended-spectrum β-lactamase (ESBL)-producing bacteria in the pig production chain is a public health concern.

ESBL enzymes confer resistance to a broad range of β-lactams, threatening the effectiveness of antibiotic therapy for infections in both human and animal health.

✓ This study aimed to investigated the occurrence of ESBL-encoding genes in Brazilian pig production chain, as reported in scientific literature.

METHOD

✓ A systematic review was conducted to address current knowledge of AMR within Brazilian pig production chain.

✓ The studies that reported the presence of ESBL-encoding genes were included in this analysis.

✓ An overview of the study selection is given below:

Identification

Records yielded: n=2,109 ⇨ 923 duplicates removed

Screening and eligibility

Records screened for title and abstract. : n=1,186 ⇨ Excluded studies: n=1,080

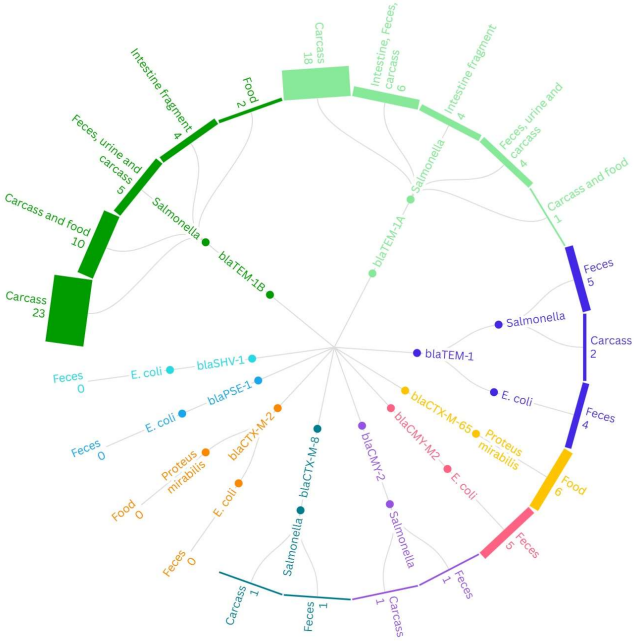
Full-text assessed for eligibility : n=232 ⇦ Identification via cross-reference search during screening: n=12

Included

Studies included in the review: n=58
Studies reporting ESBL-enconding genes: n=12

RESULTS & DISCUSSION

✓ ESBL-encoding genes were detected in pig feces, intestine, urine, carcass, and pork-based food.



✓ blaCTX-M genes are usually the most abundant among *Enterobacterales* isolated from food-producing animals. However, we found **blaTEM** genes to be the most abundant, consistent with findings reported in other pig production chains[2,6].

The detection of ESBL-encoding genes in fecal samples underscores the critical issue of AMR spread from animal husbandry throughout the environment.

CONCLUSION

✓ The pig industry may contribute to the spread of ESBL-encoding genes, posing a public health risk.

✓ The findings of this research highlight the need for integrated strategies to control AMR, particularly to reduce risks that may arise from animal -based food production systems.

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