

DETECTION OF ESBL-PRODUCING *ESCHERICHIA COLI* AND VANCOMYCIN RESISTANT *ENTEROCOCCI* (VRE) FROM FARM SLURRY IN PORTUGAL

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Introduction

- ✓ Use of organic manures such as cow slurry is the most economic, practical, environmentally beneficial and useful option for improving soil quality and fertility.
- ✓ The most common organisms that are generally found in these wastes are bacteria and fungi.
- ✓ These microorganisms use the components of the waste as the substrate for their growth.
- ✓ The different aspects of environmental and public health concerns are caused due to the abundance of antibiotics resistance (AR), and the effects of released leachate on the various environmental reservoirs and human health by this waste (Soares et al., 2019 Anand et al., 2021).

Material and Methods

- ✓ In this study, slurry samples on a herd level were evaluated instead of individual faeces samples from all cattle, to classify herds with regard to the presence of ESBL producing *Escherichia coli* or Vancomycin Resistant Enterococci (VRE).
- ✓ Each sample was seeded in Levine agar (Oxoid, Basingstoke, UK) plates supplemented with cefotaxime (2 mg/mL) and incubated during 24 h at 37°C.
- ✓ Susceptibility to 14 antimicrobial agents determined by the disc diffusion method. ESBL-phenotypic detection was carried out by double-disc diffusion test [EUCAST, 2017].
- ✓ Antimicrobial susceptibility was tested by the disk diffusion method according to the criteria of the European Committee on Antimicrobial Susceptibility Testing (EUCAST, 2017) for enterococci. Five antibiotics were tested.
- ✓ Minimal inhibitory concentrations (MICs) of teicoplanin, vancomycin, and ampicillin were determined by the agar dilution method and by using the susceptibility breakpoints recommended by the European Committee on Antimicrobial Susceptibility Testing (EUCAST, 2017).

Results

- ✓ From the slurry samples of 7 of the 32 dairy herds, ESBL producing *E. coli* were cultured in 21.9%.
- ✓ From the slurry samples of 6 of the 32 dairy herds, VRE were cultured in 18.8%.
- ✓ Three farms (3/32) (2, 29 and 30) simultaneously presented ESBL and VRE.
- ✓ Amongst the strains tested, the highest percentage of resistance was to ampicillin (56.3%), followed by oxytetracycline, streptomycin and sulphonamide (41.1, 39.6 and 37.3%, respectively).

Conclusion

- ✓ With the quantity of slurry applied on the soils as fertilizer every year, there is a need of studies to measure the leaching of pathogenic agents, antibiotics residues normally present in slurry, and their fate in the environment using for that a One Health approach.
- ✓ The use of high doses of antibiotics in animal feed increases the number of antibiotic-resistant bacteria that may spread their genes into the environment after slurry disposal on fields (Gonçalves et al., 2010; Poeta et al., 2005; Soares et al., 2021).