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## Antimicrobial resistance in bacterial strains isolated from different types of Portuguese cheese

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The present work aimed to study an eventual antimicrobial resistance and the presence of  $\beta$ -lactamases in enterobacteria isolated from cheese.  $\beta$ -lactams are among the most common antibiotics used for bacterial infections. Rates of bacterial resistance to antimicrobial agents are increasing world wide and the presence of  $\beta$ -lactamases is among one of the most common resistance mechanisms. In the present study we used twenty cheese samples, corresponding to six different types of Portuguese cheese, collected from local retail establishments. Samples were screened for the presence of  $\beta$ -lactams resistant *Enterobacteriaceae* in selective media with high concentration values of ampicilin. Colonies presumed to be resistant to ampicilin were further confirmed by antibiogram testing against other 13 different antibiotics, including six  $\beta$ -lactams. A total of 160 isolates were recovered from the selective media. The presence of  $\beta$ -lactamases on colonies was detected by adding nitrocefin to the cell biomass. After antibiogram testing about 40 isolates were confirmed to be resistant to, at least, one  $\beta$ -lactam subclass. The results obtained in this study point out to the presence, in different cheese samples, of *Enterobacteriaceae* resistant to  $\beta$ -lactams and the presence of  $\beta$ -lactamases. These results suggest that cheese may be a source of potential resistance transfer to the normal gastrointestinal flora of the consumer, which may be a cause of serious public health problems.

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## Enterococci: is their high environmental adaptability a risk to food safety?

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Enterococci are ubiquitous organisms able to promote both health (fermented food/probiotics) and illness (human/animal infections). Disturbingly, several enterococcal species commonly involved in infection, such as *Enterococcus faecalis* and *E. faecium*, can also be found in artisanal cheeses, posing a problem for food safety. Enterococci from ewe's milk and cheese were compared to clinical and reference strains by growth in several media simulating different environmental colonization and infection sites: 2YT, BHI, skim milk, urine and rabbit serum at different pHs, NaCl concentrations and temperatures. Growth curves were obtained with Microbiology Workstation Bioscreen C® and used to calculate the optimization index - OI - (based on absorbance, lag phase and specific growth rate) for each strain and environmental condition. Similar or higher OIs were obtained for food strains growing in infection related environments when compared to clinical ones, revealing their ability to adapt and grow in these conditions. A dendrogram built using Pearson's correlation coefficient clustered the strains regardless of their origin or species allocation, suggesting a strain-specific mode of growth and a high environmental versatility of enterococcal strains. With these evidences we can speculate on the pathogenicity potential of food enterococci, questioning the food safety of products harboring these bacteria for vulnerable consumers.

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