

Title: SPREAD OF MULTIDRUG RESISTANT GRAM POSITIVE COCCI ISOLATED FROM SOFT CHEESE IN BRAZIL

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Abstract:

Brazil is a major consumer and producer of dairy products. Although most of Brazilian dairy products meet high technological standards, it is still observed issues regarding the raw milk production which may reduce the product quality. Several microbe species may contaminate milk during manufacture and handling. Minas Cheese is traditionally produced in Minas Gerais and is economically and culturally important to the Brazilian dairy industry. Gram positive cocci such as *Enterococcus* spp. and *Staphylococcus* spp. have been frequently associated to cheese contamination. As long as antibiotic resistance is a public health concern, and antimicrobial usage is still uncontrolled in dairy cattle, especially in Brasil, horizontal transfer of antimicrobial resistance genes in foodstuffs such as cheese may be of particular concern. This study was focused on isolation of Gram positive cocci from Minas Cheese and screening of antimicrobial resistance markers in isolated bacteria. Samples of 25 mg belonging 35 Minas Cheeses representative of 7 different trademarks and purchased from different grocery stores in Juiz de Fora, Minas Gerais were evaluated. After tenfold serial dilution the cheese samples were processed for selective culture and isolation of Gram positive cocci. All the isolated bacteria were identified by DNA sequencing after genomic DNA isolation and amplification of specific DNA region codifying for the 16S rRNA. Antimicrobial resistance genetic markers were screened by PCR. Overall, 208 strains were isolated and identified as follows: *Enterococcus faecalis* (47.6%), *Macrococcus caseolyticus* (18.3%), *E. faecium* (11.5%), *E. caseliflavus* (7.7%), *Staphylococcus haemolyticus* (7.2%), *S. aureus* (4.3%), *S. epidermidis* (2.9%) and *E. hirae* (0.5%). The genetic markers *mecA* (78.0%) and *smr* (71.4%) were the most detected. Other genetic marker such as *blaZ*, *msrA*, *msrB*, *linA* and *aacA-aphD1* were also detected in all 7 different cheese trademarks evaluated. Although enterococci comprise a large group of lactic acid bacteria which are of importance in cheese maturation, the isolated species along with staphylococci, may suggest microbial contamination during the manufacturing chain related to both milk origin and sanitary quality control. The occurrence of antimicrobial resistance markers and potentially pathogenic bacteria observed are of special concern, especially considering the potential transmission of genetic determinants to human pathogens through the food chain.

Keywords: Minas Cheese, resistance, *Enterococcus*, antimicrobial

Financial support: CNPq, CAPES, FAPEMIG