

TITLE: CAPACITY OF LACTIC ACID BACTERIA TO REDUCE AFLATOXIN M₁ IN MINAS FRESCAL CHEESE

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ABSTRACT:

Aflatoxins are secondary metabolites of some *Aspergillus spp.* Aflatoxin M₁ (AFM₁) is a product of aflatoxin B₁ (AFB₁) metabolism in the liver, consequently, it is carried over to dairy products. Lactic acid bacteria (LABs) are a heterogeneous group of gram-positive, nonsporulating, aerotolerant, sugar fermenting bacteria found in different kinds of foods including milk and dairy products which produce lactic acid as the main product of their fermentation. Several surveys have proved the capacity of LABs to reduce mycotoxins of food. The efficiency of these bacteria to reduce AFM₁ can be related to fermentation, antibiosis, and the capability of the microbial cell wall to bind to the contaminant. So far there is no study in Brazil that has used LABs to reduce AFM₁ in Minas cheese. Therefore, the current study was aimed tested two different strains of LABs (*Lactobacillus rhamnosus* and *Lactococcus lactis*) to reduce the AFM₁ in Minas fresh cheese contaminated artificially (2,5 µg/kg). The cheeses were produced in the Laboratory of Microbiology and Mycotoxicology of Food from the Faculty of Animal Science and Food Engineering of the University of São Paulo. The cheeses were produced in triplicate. Twelve cheeses with 250 grams each were prepared for the tests separated in four treatments: cheese, cheese with LABs, cheese with AFM₁ and cheese with AFM₁ and LABs. The LABs were heat-killed being inactivated by boiling at 100°C for 1 hour previously the assays and were used together at concentration 10¹⁰CFU/mL. The capacity of LABs to reduce AFM₁ was assessed over time the determinations of AFM₁ in the contaminated cheeses were realized in the second and in the thirtieth day after the manufacturing. AFM₁ quantification in cheese achieved by injection into a HPLC system. The limit of detection for AFM₁ was 0.017 µg/kg. The cheeses of the control groups (cheese and cheese with LAB) did not show any level of AFM₁, endorsing that the milk used to produce the cheeses did not contain AFM₁. In the groups containing AFM₁, (cheese with AFM₁ and cheese with AFM₁ and LAB), a reduction percentage of 66% and 70% was observed respectively, during the experimental period. The LABs showed a promising capacity to reduce AFM₁ in Minas frescal cheeses.

Keywords: Mycotoxins, dairy products, detoxification, microbiology

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