

Title: ADDITION OF SELECTED LACTIC ACID BACTERIA FROM GOAT MILK IN ARTISANAL GOAT CHEESE FOR MICROBIOLOGICAL EVALUATION

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Abstract:

A number of studies have confirmed *in vitro* inhibition of pathogens by Lactic Acid Bacteria (LAB). The objective of this study was to evaluate the inhibitory action of selected LAB from goat milk against *Escherichia coli* in artisanal goat cheese. The cheeses were manufactured in accordance with the traditional procedure employed by smallholders in the semi-arid region of Pernambuco. Three goat cheeses (1, 2 and control) were prepared in the laboratory under aseptic conditions. The difference in preparation among the three cheeses was the addition or absence of inoculum. In the first cheese (cheese 1), one inoculum containing a pathogenic bacteria *E. coli* suspended in 33.8 mL (1% milk volume) of sterile distilled water with a population of 10⁸ CFU/mL was added as a positive control. In the second cheese (cheese 2), 33.8 mL of sterile distilled water containing 10⁸ CFU/mL *E. coli* and 10² CFU/mL of a mixture of ten selected LAB was added (UNIVASF CAP 4, 14, 20, 27, 29, 35, 38, 43, 138 and 139). In the third cheese, there was no microbial inoculation: the cheese was the negative control. The cheeses were weighed for calculating yield, packed in sterile plastic bags and stored at 4 °C for a total of 20 days. Bacterial enumeration, pH and lactose were performed on the days 0, 5, 10, 15 and 20 after preparation of the cheeses. Statistical analysis was performed. The cheese yield was 13.28% and 13.30% and 13.27% for the cheese 1, 2 and 3, respectively. *E. coli* were not detected in the samples from the negative control. In the samples from the positive control (cheese 1), naturally present LAB were detected at 7 log CFU/g. The LAB increased linearly until the end period by 0.0132 and 0.046 log units per day in the cheese 1 and 2, respectively. In cheese 2 and 1, the pathogen populations decreased linearly over time by 0.24 and 0.0796 log units per day, respectively. Thus, the reduction of the population of *E. coli* was observed in cheese with added of selected LAB from goat milk. Changes in pH and lactose were observed between cheeses 1 and 2. The pH values of cheese without and with LAB isolates decreased linearly over time, by 0.0362 and 0.042 pH units per day, respectively. The lactose content decreased linearly over time, by 0.0309 and 0.033 units per day in cheese 1 and 2, respectively. The cocktail of isolates UNIVASF CAP improved microbiological safety of cheese against *E. coli*.

Key words: Goat cheese, Lactic Acid Bacteria, *Escherichia coli*, inhibition

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