

References

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Use of Simulated Gastrointestinal Fluid to Evaluate the Survival of *Bifidobacterium Animalis* in Caprine Acid-coagulated Cream Cheese

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Introduction

The incorporation of additional health attributes into foods constitutes an excellent business opportunity due the ever-growing functional food market and the high added value of these products. The use of cheese as a vehicle for probiotic cultures has emerged as highly promising and the use of goat's milk for this purpose is justified by its compositional characteristics that ensure lower allergenicity and greater digestibility. In addition, encouraging the consumption of goat's milk also drives the development of goat raising and breeding among small farmers.

Methods

In this study, an acid-coagulated cream cheese were made from goat's milk at the facilities of Embrapa Goats and Sheep in the town of Sobral, Brazil. The cheeses were added with *Bifidobacterium animalis* and evaluated after 28 days of cold storage to determine the number of surviving probiotic organisms in gastrointestinal digestion simulation trials. The counts of *B. animalis* in the cheese samples were performed in MRS-LP culture medium, after incubation under anaerobiosis at 43°C for 72h. The survival of *B. animalis* in the cheese was evaluated in simulated gastric and enteric juices containing enzymes from the gastrointestinal tract. For the purpose of this test, cheese samples were diluted in 0.1% peptone water and added to an acid solution at pH 2.5 containing pepsin (3g/L). Next, the samples were incubated at 37°C in a shaker at 150 rpm for 120 min. In sequence, the pH was changed to 5.6 for another 120 minutes and finally changed to pH 7.5 for the last 120 minutes. During the enteric fluid simulation steps the samples were additionally added with bile (Oxgall) in a proportion adequate to obtain a final concentration of 3g/L, so as to simulate small intestine conditions. Each experiment took 6 hours to complete (120 min for each pH tested). Aliquots were withdrawn at 120-minute intervals for probiotic counts.

Results

Bifidobacterium animalis counts in the cheese samples after 28 days storage were 8.33 log cfu/g. Upon completion of the test simulating gastrointestinal conditions, the populations of bifidobacteria had been reduced to 7.78, 6.96 and 7.01 log cfu/g in the cheeses exposed to gastric (pH 2.5) and enteric (pH 5.6 and 7.5) fluids, respectively.

Discussion

Brazilian legislation requires a minimum of 8-9 log viable cells per daily portion of probiotic product consumed. Thus, a portion size of 30g of caprine acid-coagulated cream cheese contained approximately 8-9 log viable cells before and after the simulation tests, allowing to conclude that the probiotic counts after exposure to the action of the gastric and enteric juice formulated with pepsin and bile were satisfactory.

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