TITLE: PRESENCE AND GROWTH PREDICTION OF *Staphylococcus* spp. AND *s. aureus* IN MINAS FRESCAL CHEESE, A SOFT FRESH CHEESE PRODUCED IN BRAZIL

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ABSTRACT: Minas Frescal is one of the most popular cheeses in Brazil. Physical-chemical characteristics of Minas frescal cheese (MFC), such as high moisture, low sodium and pH close to neutrality favor the survival and growth of *Staphylococcus* spp., and allow the production of enterotoxins by specific strains. Thus, it is necessary to know the conditions that allow the staphylococcal growth to prevent this eventual enterotoxin production. Mathematical models provide predictions of microbial behavior under varying environmental conditions, being possible to know the best conditions to avoid microbial growth. Here, we aimed to characterize the physical-chemical aspects and the presence of *Staphylococcus* spp. in MFC to support a modeling study for the growth by this microorganism. MFC samples (n = 50) were obtained from retail sale and subjected to *Staphylococcus* enumeration according to ISO 6888-1 and characterized for pH, storage temperature and sodium chlorine content. The growth kinetics (maximum growth rate - Grmax - and lag time) of *S. aureus* was predicted using the ComBase considering different conditions of temperature, pH, and sodium chloride (salt) content. Mean counts of *Staphylococcus* spp. ranged from 3.3 log CFU/g to 6.7 log CFU/g, indicating poor hygiene practices during production. pH, temperature and salt content ranged from 5.80 to 6.62, 5 °C to 12 °C and 0.85% to 1.70%, respectively. Grmax values ranged from 0.012 log CFU/g/h to 0.419 log CFU/g/h. The temperature and pH factor significantly affected the Grmax values ($P < 0.05$), while salt content factor did not influence the Grmax values for *S. aureus* ($p > 0.05$). Independently of the storage temperature, the lowest Grmax values (0.012 to 0.372 log CFU/h) were obtained when pH 5.80 was associated to salt content of 1.7%; independently of the pH and salt content, the best temperature to avoid staphylococcal growth was 7.5 °C. Hygienic conditions during MFC production must be adopted to avoid staphylococcal contamination and storage at temperatures lower than 7.5 °C can prevent staphylococcal growth and the potential production of enterotoxins.

Keywords: fresh cheese; Staphylococcus; enterotoxins; growth modelling

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