

Título: EVALUATION OF *STAPHYLOCOCCUS AUREUS* AND *ESCHERICHIA COLI* BEHAVIOR IN TOMATO SAUCE BY APPLYING HEAT TREATMENT

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Resumo:

Heat is one of the methods more used to destroy microorganisms. However, the relationship between time and temperature is specific to each organism and it depends on the characteristics of the environment in which it appears. In Brazil, the hot dog is a widely consumed food, being the tomato sauce an essential material for its manufacturing. According to Brazilian law cooked foods should be kept in temperature above 60 °C to consumption. At this temperature it is expected that microbial growth is prevented, and some species are inactivated. The aim of this work was to evaluate *Staphylococcus aureus* and *Escherichia coli* behavior in tomato sauce under heat treatment. For this, commercial tomato sauce was inoculated with a pool of *S. aureus* (ATCC 1901, ATCC 25923 and one strain isolated from hot dog) and *E. coli* (ATCC 8739, ATCC 25972 and one strain isolated from hot dog), separately, obtaining approximately 6.5 log CFU/g as initial microbial count. Then, samples were heated to 60 °C in a water bath for 30 minutes. At each 3 minutes samples were removed, cooled in an ice bath, and quantified by plating out in BHI agar culture medium. The experiment was performed in triplicate. The obtained microbial counts were statistically analyzed by ANOVA, applying Tukey Test ($p < 0.05$), using the software Statistic 8.0. The results showed that the maintenance of tomato sauce at 60 °C reduced *S. aureus* and *E. coli* population in approximately 2.5 log CFU/g up to 12 minutes. After this moment there was not a significant reduction in microbial contamination for both microorganisms. The obtained result is very interesting since the tomato sauce pH is approximately 4.2. Once this product is acid, it was expected that the heat treatment at 60 °C was sufficient to inactivate the high microbial population studied. On the other hand, it is important to consider that the pool used in this work contained one strain isolated from a tomato sauce used in hot dogs. So, the strain isolated from it could be more thermal resistant, since high temperatures are used to maintenance the tomato sauce during the hot dog production. This could activate the heat-shock proteins, explaining the reason why there was no inactivation of the analyzed strains. Therefore, these results fortify the applicability of risk factors as temperature and time in food production to reduce the amount of pathogens to acceptable levels.

Palavras-chaves: tomato sauce, thermal inactivation, *Staphylococcus* coagulase positive, *Escherichia coli*