

TITLE: BEHAVIOR OF THE GROWTH OF THE MULTI-DRUG RESISTANT (MDR) *Salmonella enterica* SEROTYPE ENTERIDIS IN GROUND MEAT

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ABSTRACT:

Salmonella spp. is one of the major pathogens associated with various outbreaks of foodborne illness. Because of this, it is important to understand its behavior in products and processes. In this study, the behavior of an MDR isolate of the *S. enterica* serotype Enteritidis was evaluated in cooled ground beef. The caramel cuts (soft semimembranosus muscle) were ground with a grinder and the meat was then inoculated with 20 mL at the 6 log CFU/mL concentration of the *S. enterica* serotype Enteritidis. Subsequently, 30 patties of about 60 g each were individually wrapped in low density polyethylene bags under natural atmosphere and then properly sealed. A treatment control without any inoculation was used to monitor the initial and final microbiological load. A total of 15 patties were stored at 4°C and another 15 were stored at 10°C in B.O.D. type incubators. Every 6 hours, a sample of each heat treatment was evaluated and the total count of psychophiles, psychrotrophs and *Salmonella* spp. were obtained. A higher growth of mesophiles was observed at 4°C, starting from an initial count of 4.6 reaching 11.2 log CFU/g after 84 hours. Psychrotrophs presented a final concentration of 8.3 log CFU/g, while *S. enterica* Enteritidis MDR showed low growth. High growth of mesophiles and psychrotrophs (11.5 and 10 log CFU/g, respectively) was observed at 10°C, while *Salmonella* spp. did not develop. Despite the inoculation of a significant concentration of viable cells of the pathogen, its growth at both temperatures under experimental conditions was not very significant due to competition with mesophiles and psychrotrophs. However, it is important to note that, in spite of the greater development of deteriorating microorganisms, the initial amount of the pathogen was not reduced, indicating that the pathogen remained in the stationary phase and was viable in the food product, requiring careful handling due to cross contamination risks. During the storage period, it is paramount to avoid abusive temperatures that favor the rapid growth of deteriorating microorganism.

Keywords: beef, predictive microbiology, pathogens in meat

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