

EVALUATION OF THE EFFECTIVENESS OF A QUATERNARY AMMONIUM-BASED COATING IN PREVENTING SALMONELLA CROSS-CONTAMINATION

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ABSTRACT

Kitchens are environments with many bacteria, most harmless, but pathogens such as *Salmonella* spp. have also been found. These pathogens are worrying due to their accumulation in places such as refrigerators, dishwashers, cutting boards and countertops, and can be transmitted to foods, causing food poisoning. As a result, thousands of foodborne illness cases are reported every year. Thus, the objective of the present work was to determine the antimicrobial activity of a quaternary ammonium-based coating spray applied to different surfaces and, then, to evaluate its ability to prevent possible cross-contamination.

The antimicrobial activity of the coating against *Salmonella* isolates was evaluated on stainless steel, acrylic, marble and silicone surfaces, using the method recommended by ISO 22196:2011. Significant differences ($p < 0.05$) were found between treated and untreated surfaces, demonstrating the effectiveness of the coating in inhibiting these pathogens. Next, it was evaluated the ability of the coating to prevent cross-contamination between a surface contaminated with a portion of food and a portion of uncontaminated food. In this case, when incorporated into a matrix and placed on a particular coated surface, the pathogen was not inhibited and contaminated the food, which was later placed in contact with the contaminated surface. Furthermore, this cross-contamination occurred irrespective of the contact time of the food (10 seconds or 2 hours) and the surface material tested. In conclusion, it was verified that although the tested coating showed good antimicrobial activity, it was not able to reduce the transfer of *Salmonella* from the surfaces to the food, since the food matrix protected the bacteria from its action. Further tests are required, such as evaluating the effectiveness of the coating against other pathogens and using other matrices with a more significant number of samples. It would also be interesting to test the coating in combination with other antimicrobial compounds to assess the possible increase in its effectiveness in preventing or reducing cross-contamination.