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THE EFFECT OF HUMIDITY ON CELL SURVIVAL ON STAINLESS STEEL AND NOVEL ANTIMICROBIAL SURFACES

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ABSTRACT

The ability of pathogenic bacteria to be retained on the surfaces of processing equipment constitutes a major health problem for the food industry. Surfaces in industrial systems are critical components in the initiation of biofouling because they serve as the interface between the biological and mechanical environments. Stainless steel is commonly used in the food processing industry, but there is an increasing demand for surfaces with increased hygienic properties which decrease surface fouling by organic soils and cells. One way to combat microbial surface fouling is the use of novel antimicrobial alloys. Although many metal ions in solution demonstrate a significant antimicrobial effect, in the relative absence of moisture, surface release rates and the efficacy of the antimicrobial agent are significantly altered.

In preliminary studies using stainless steel, silver and copper, and other alloys, increased humidity increased survival of microorganisms on surfaces lacking antimicrobial properties, but anticipated antimicrobial effects were often enhanced. It is essential to clearly define experimental and environmental conditions when evaluating potential antimicrobial surfaces or treatments: such investigations form the basis of the current study.