

TITLE: ACTIVITY OF NISIN ON GROWTH AND BIOFILM FORMATION OF *Salmonella* Enteritidis

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ABSTRACT:

Salmonella enterica is an important foodborne pathogen, which causes gastroenteritis and enteric fevers, of worldwide importance. The control of microbial growth using antimicrobial peptides has been demonstrated over the years. Nisin is a cationic peptide targeting the lipid II of the inner membrane of prokaryotes and has been intensively used in the control of gram-positive bacteria. The aim of this work was to evaluate the action of nisin on the growth and formation of biofilm by *Salmonella* Enteritidis PT4 578, a gram-negative pathogen, under buffering conditions of culture medium. Therefore, standard inoculum of 0.1 optical density at 600 nm (OD_{600 nm}) (approximately 10⁷ CFU.mL⁻¹) was inoculated in brain heart infusion broth (BHI) without buffering and buffered with PBS pH 7.0 with different concentrations of nisin (0; 1.46; 5.86; 11.72; 23.44; 46.88; 93.75; 187.5 µM) in plates 96-well. The plates were incubated at 37 °C for 24 h and the bacterial growth determined at OD_{600 nm}. After 24 h of incubation, cells adhered to the surface were stained with violet crystal and the absorbance at 590 nm (OD_{590 nm}) was determined. The data of biofilm formation were expressed as the ratio between the absorbance at 590 nm and 600 nm (OD_{590/600 nm}). The Tukey test was used to compare the means. *Salmonella* Enteritidis PT4 growth was reduced in buffered BHI broth and nisin significantly interfere at concentrations above 11.72 µM, whereas concentrations below 23.44 µM on BHI without PBS did differ from the control. Sub-inhibitory concentrations of nisin did not interfere with biofilm formation but in the presence of the higher concentration (187.5 µM) the biofilm formation was enhanced. These data indicate that nisin may act on the growth of *Salmonella* independently of the pH control of the culture medium and interfere with biofilm formation.

Keywords: buffer, food infections, antimicrobial, pathogen.

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