

Title: ACTIVITY OF NISIN AND BOVICIN HC5 COMBINED TO EDTA IS DIFFERENTLY INFLUENCED BY TEMPERATURE AND PH CONDITIONS

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Abstract:

In general, bacteriocins produced by Gram-positive bacteria, such as nisin and bovicin HC5 has not activity on Gram-negative bacteria, such as *Salmonella*. The presence of outer membrane in these bacteria prevents the diffusion of bacteriocins to their site of action: the cytoplasmic membrane. Therefore, treatments that destabilize the outer membrane are used in combination to bacteriocins to sensitizes them. Several factors such as temperature, pH and composition of medium can influence the activity of bacteriocins, although this topic has still poorly understood. In this work, we demonstrated that temperature and pH conditions influence differently the activity of bovicin HC5 and nisin on *Salmonella* Typhimurium. The culture of *S. enterica* serovar Typhimurium ATCC 14028 was cultured in brain and heart infusion broth (BHI) for 24 h at 37 °C and inoculated at cell density of 10⁵ CFU/mL in BHI broth with different pH values added of nisin or bovicin HC5 (200 AU/mL) and EDTA (1.5 mM). The cells were incubated at different temperatures, according to experimental design of central composite with two factors. Cell viability was evaluated at different time intervals during 48 h, by microdrops technique on plate count agar (PCA). Nisin acted faster and in greater range of temperature and pH, promoting significant reductions in the cells counts, whereas bovicin HC5 exerted bacteriostatic activity in wide range of conditions and bactericide activity only at specific temperature and pH conditions. These results demonstrated that environmental conditions could influence differently the action of the bacteriocins, and its need be understood to favor the appropriate use of each bacteriocin.

Keywords: bacteriocins, biocontrol, environmental conditions, *Salmonella*.

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