

TITLE: EVALUATION OF THE ANTIMICROBIAL ACTIVITY OF PRODUCTS BASED ON POTASSIUM MONOPERSULFATE AIMING THE DISINFECTION OF WATER SUPPLY SYSTEMS IN POULTRY FARMS

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ABSTRACT:

Brazil is one of the world's largest producers and exporters of chicken meat. Bird drinkers used on farms are highly susceptible to the formation of bacterial biofilms, which are among the main concerns in commercial poultry farming as they can be sources of infections for birds and, consequently, for humans. In addition to the animal and human health aspect, biofilms can also generate economic losses. In this sense, the present study evaluated the antimicrobial activity of potassium monopersulfate-based products against bacterial biofilms of Avian Pathogenic *Escherichia coli* (APEC), *Salmonella enteritidis* (S.e.) and *Listeria monocytogenes* (L.m.). The products Clim-PGA, Clim-MASTER, Clim-SEPT, Clim-SHOCK based on monopersulfate were used with a concentration of 0,05% and Clim-MD60 was used as control, mimicking chlorinated water, supplied by Hidrodomi do Brasil Ltda. Initially, tests were performed to evaluate the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the products against planktonic bacterial cells. The antimicrobial activity of the products was further evaluated in mature biofilms grown on acrylic specimens, by counting colony forming units (CFU). The analysis of morphology and microbial adhesion of biofilms was evaluated by scanning electron microscopy (SEM) and the evaluation of the live/dead assay by confocal fluorescence microscopy. The product that showed the best effectiveness against planktonic cells in the MIC test for APEC and S.e. was the MASTER, with 0.03%. In the MBC test, SEPT presented a concentration of 0.25% for the three bacteria evaluated. In biofilms, the product that showed greater activity was MASTER, with a count of zero CFU for S.e. and L.m. In the SEM analysis, it was found that MASTER had greater potential for removing the biofilm due to greater oxidative activity, due to the presence of sodium dichloroisocyanurate and monopersulfate in the mixture. In the evaluation of the live/dead assay, the products showed effectiveness in killing the bacteria, the PGA had more evidence, with 99.15% of dead bacteria for L.m. The products showed potential to be used as sanitizers on farms, with emphasis on Clim-MASTER which, in addition to killing bacteria, also demonstrated the ability to remove biofilms.

Keywords: biofilm, farms, potassium monopersulfate.

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