TITLE: DETECTION OF *icaA*, *icaC* and *icaD* GENES IN *Staphylococcus* COAGULASE NEGATIVE ISOLATED FROM GROUND BEEF

AUTHORS: PAVAN, A. C. L.; NAKADOMARI, G. H.; VIGNOTO, V. K. C.; WOSIACKI, S. R.

INSTITUTION: UNIVERSIDADE ESTADUAL DE MARINGÁ, UMUARAMA, PR (ESTRADA DA PACA, S/N, BAIRRO SÃO CRISTÓVÃO, CEP 87507-190, UMUARAMA – PR, BRASIL)

ABSTRACT:

Coagulase negative staphylococci (ECN) comprise most of the existing species, with *Staphylococcus epidermidis* being the most isolated in humans. Biofilm production is an important virulence factor presented by this group, conferring protection to the environment and host. Intercellular Polysaccharide Adesin (PIA) is the main responsible for biofilm production in Staphylococcus, being encoded by *icaADBC operon* genes. The *icaA* gene encodes the N-acetylglicosaminatranferase enzyme that synthesizes N-acetylglucosamine, and the *icaD* gene is of great importance in the expression of this enzyme. The objective of this work was to evaluate the presence of *icaA*, *icaC* and *icaD* genes in ECN isolated from ground beef. We used 30 ECN samples phenotypically characterized as biofilm producers using Congo Red Agar. All samples were submitted to PCR (Polymerase Chain Reaction) for the detection of *icaA*, *icaC* and *icaD* genes. Of the 30 samples evaluated, 26 (86.7%) presented the three genes, 3 (10.0%) presented the genes *icaA* and *icaD* and one sample was negative for all genes surveyed. The ability to form biofilm by staphylococci has a relevant role in the contamination and dissemination of this microorganism, its presence in ground meat indicates inadequate hygienic-sanitary conditions, demonstrating the importance of adequate handling and hygiene of equipment and utensils used in food processing. The *icaA* and *icaD* genes are considered the most reliable markers in the genotypic identification of biofilms because they are more sensitive when compared with other genes also related to the formation of biofilms. The presence of a negative sample demonstrates that these genes are not the only ones involved in biofilm production in coagulase negative *Staphylococcus* isolated from ground meat, since this sample had been phenotypically characterized as a biofilm producer. The results demonstrate the importance of *icaA*, *icaC* and *icaD* genes, however, they suggest the presence of a single-independent alternative mechanism in staphylococcal biofilm formation in these samples.

Keywords: Biofilm, Food, PIA, PCR