TITLE: COMPOSITION AND ULTRASTRUCTURE OF *Campylobacter jejuni* SIMPLE AND MIXED BIOFILMS

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ABSTRACT:

Campylobacter jejuni is one of the microorganism most involved in food-borne gastroenteritis in the United States and Europe and the consumption of chicken meat is the main incriminated in the transmission. In the environment, this agent can survive in the form of highly organized structures, called biofilms, through which they can tolerate adverse conditions, such as the presence of antibiotics and chemical agents. Knowing the extracellular matrix of these structures and their interaction with other microorganisms is important because it allows creating effective control tools, mainly in the chicken processing industries. The aim of this study was to evaluate the composition and ultrastructure of simple and mixed biofilms of *C. jejuni* isolated from chicken carcasses destined for national and international market under and without supplementation with chicken juice. Three distinct phylogenetically *C. jejuni* strains were used. These strains were submitted to the formation of biofilms and their biomass quantified by violet crystal methodology in microplate. For mixed biofilms, co-culture with *Escherichia coli* (ATCC 25922), *Pseudomonas aeruginosa* (PAO 1), *Salmonella* Enteritidis (ATCC 13076) and *Staphylococcus aureus* (ATCC 25923) were performed. In parallel, the sessile structure supplemented or not with chicken juice was submitted to the stability test with sodium metaperiodate and proteinase. The culture in glass beads was evaluated in order to verify the morphological differences in the ultrastructure by MEV technique. The biomass formed in the simple and mixed biofilms supplemented was significantly higher (BFI> 1.70), indicating the nutritional stress efficiency in the sessile form acquisition. The composition of the biofilms was predominantly protein, with a mean of 1.52 in the IFB in biomass, with a three-dimensional structure and an expanded and stable architecture, besides irregular coverage. The exceptions found are related to mixed biofilms with *P. aeruginosa*, which include a carbohydrate-rich matrix, lower sessile form in chicken juice and compact biofilm architecture, which make up the intrinsic characteristics of *P. aeruginosa*. *C. jejuni* presented a competitive disadvantage in all co-culture assays, probably due to the reduced time to biofilm formation. This study shows that in chicken juice, simple and mixed biofilms of *C. jejuni* present higher intensity, protein composition and mature structure, except when the interaction is with *P. aeruginosa*. The results reinforce the importance of hygiene processes in the slaughter environment.

Keywords: biomass, chicken juice, extracellular matrix, sessile form

Development Agency: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)