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XXXIX Reunión Científica Anual de la Sociedad de Biología de Cuyo

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San Luis- Argentina

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71. EVALUATION OF PHYSICAL-SANITARY CONDITIONS IN BUTCHER SHOPS OF JUSTO DARACT, SAN LUIS.

Lucero M1,2, Escudero ME2, Lucero-Estrada C2,31Departamento de Ciencias Aplicadas y Tecnología, Escuela de Ingeniería y Ciencias Ambientales – UNVIME- Villa Mercedes y Justo Daract, San Luis. 2 Área Microbiología e Inmunología - FQByF-UNSL, 3 Laboratorio de Investigación en Microbiología (LABIMIC-IMIBIO-CONICET-UNSL) marielalucero.unvime16@gmail.com

Foodborne diseases are caused by ingestion of foodstuffs contaminated by microorganisms or chemicals. They are considered a growing public health problem worldwide. Foodstuff manufacturing equipment and the surrounding environment may serve as potential reservoirs of contamination. Foodborne pathogens are the cause of acute and chronic diseases. Food contamination by microorganisms may occur at any stage in the process from food production to consumption, and may be the result of environmental contamination. Moreover, cross contamination of food with pathogens in the retail environment is an important problem that contributes to an increased risk of foodborne illness. Some pathogenic bacteria such as Listeria monocytogenes, Salmonella spp. or Escherichia coli O157:H7 have the ability to attach onto stainless and other food-contact surface materials; as consequence, foodstuff manufacture equipment and the surrounding environment may serve as potential reservoirs of contamination. The aim of this work was to establish possible risk variables for contamination of meat products depending on the physical-sanitary conditions of facilities, equipment, and the personal hygiene of workers of butcher shops in the city of Justo Daract, San Luis, Argentina. This city located at the east region of San Luis province has 10 butcher shops for a population of 13,130 inhabitants. A risk quantification using a checklist was applied at every butcher shop in the city during September-December 2019. The checklist included five groups of variables (total value, 100): 1) situation and conditions of the building (10.0), 2) equipment and tools (15.0); 3), handlers (25.0), 4) raw materials and products for sale (20.0), and 5) production flow (30.0). Risk assessment on a 1–100 scale was quantified as high-risk (1–40), moderate-risk (41–70), or low risk (71–100). Risk quantification in all butcher shops resulted in two (20.0%) moderate-risk and eight (80.0%) low-risk shops. Minimum-maximal values obtained for each group of the five variables were as follows: situation and conditions of construction, 6.0-9.0; equipment and tools, 10.5-15.0; handlers, 18.7-25.0; raw materials and products for sale, 6.6-20.0; and production flow, 15.1-30.0. Due to the results obtained, some changes are recommended: i) to implement programs of good hygienic and manufacturing practices that allow a strict and constant sanitary control to ensure food safety; and ii) to train butcher shop personnel through a Guide or Protocol of Good Handling Practices to improve the microbiological quality of the product and the hygienic-sanitary conditions of sale establishments and thus, minimize the disease risk that might represent the consumption of meat products.

72. ANTIMICROBIAL ACTIVITY OF BACTERIOCIN-PRODUCING Yersinia spp. AGAINST FOODBORNE PATHOGENIC BACTERIAL STRAINS

Brarda BS1, Iriarte HJ1,2, Salinas Ibañez AG1,3, Lucero Estrada CSM1,2, Favier GI1. 1 Área de Microbiología e Inmunología de la Universidad Nacional de San Luis, San Luis, Argentina. 2 Instituto Multidisciplinario de Investigaciones Biológicas del Consejo Nacional de Investigaciones Científicas y Técnicas (IMIBIO - CONICET), San Luis, Argentina. 3 Instituto de Física Aplicada del Consejo Nacional de Investigaciones Científicas y Técnicas (INFAP - CONICET), San Luis, Argentina. brendabrarda@gmail.com

Bacteriocins (BAC) are bacterial metabolites that act by inhibiting the growth of related or unrelated species; thus, BAC have been studied as biocontrollers of foodborne pathogens as these compounds are also considered GRAS (generally recognized as safe). Non-pathogenic Yersinia species, such as Y. intermedia, Y. frederiksenii, and Y. enterocolitica biotype 1A use to be BAC producers exhibiting inhibitory effect against pathogenic Y. enterocolitica strains (biotypes 1B, 2-5). The aims of this work were: i) to evaluate the antimicrobial activity of BAC produced non-pathogenic Yersinia strains against foodborne pathogens bacterial strains, and ii) to evaluate this activity at different temperatures. For this purpose, four Y. intermedia (10, 79, 85, 96), two Y. fredericksenii (73, 74), and two Y. enterocolitica 1A (66, 89) strains were used as bacteriocin-producing strains (BPS). As indicator strains (IS) eight pathogens were tested: Salmonella sp., Shigella flexneri, Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Bacillus cereus, Listeria monocytogenes and Y. enterocolitica 1B. The spot-plate technique was performed on a double-layer agar. BPS and IS were cultured in Luria Bertani broth (LB) at 25°C for 18 h. Inocula were adjusted to a concentration corresponding to a DO610 of 0.2 and 10 µl of each BPS were spot plated onto semisolid agar previously inoculated with IS. Plates were incubated at 10°C, 25°C and 37°C for 18 h, in duplicate. The sensitivity of the IS was evident by the presence of halos around the BPS; in addition, the diameters of the halos (mm) were measured. Among the eight BPS tested, only two Y. intermedia (96 and79) and two Y. enterocolitica 1A (66 and 89) were active against L. monocytogenes and Y. enterocolitica 1B. For L. monocytogenes the inhibition at 10°C was: BPS 66: 14.25±1.25 mm, BPS 79: 14±0 mm, BPS 89: 14.5±1 mm, BPS 96: 15±1.5 mm; at 25°C was: BPS 66: 10.75±0.25 mm, BPS 79: 14.25±0.25 mm, BPS 89: 14.5±2 mm, BPS 96: 13.15±0.35 mm. For Y. enterocolitica the inhibition at 10°C was: BPS 66: 16.5±0.5 mm, BPS 79: 16±1 mm, BPS 89: 16±1 mm, BPS 96: 15.25±1.75 mm; at 25°C was: BPS 66: 15±0 mm, BPS 79: 13.5±2 mm, BPS 89: 15.5±0.5 mm, BPS 96: 15.75±0.75 mm. At 10°C and at 25°C there was inhibition, while at 37°C there was no inhibition. These results encourage the hypothesis that bacteriocins produced by non-pathogenic Yersinia strains could be involved in the reduction or elimination of pathogenic strains responsible for causing spoilage or foodborne illness even at refrigeration temperatures.