

**Title:** Research for *Listeria monocytogenes* and *Staphylococcus aureus* in two small-scale cheese production plants located in Goiás, Brazil.

**Authors:** Chaul, L.T.<sup>1</sup>; Oxaran, V.<sup>2</sup>; Dittmann, K.K.<sup>2</sup>; Pereira, A.N.<sup>1</sup>; Lee, S.<sup>3</sup>; Corassin, C. H.<sup>3</sup>; Oliveira, C.A.F.<sup>3</sup>; De Martinis, E.C.P.<sup>4</sup>; Gram, L.<sup>2</sup>; Alves, V. F.<sup>1</sup>

**Institutions:** <sup>1</sup>FF/UFG, Faculdade de Farmácia, Universidade Federal de Goiás (Rua 240 esquina com a 5ª Avenida, s/n, Setor Leste Universitário, CEP: 74605-170. Goiânia/GO – Brasil); <sup>2</sup>Department of Systems Biology, Technical University of Denmark, (Matematiktorvet bldg 301, DK-2800 Kgs. Lyngby, Denmark); <sup>3</sup>FZEA/USP, Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo (Av. Duque de Caxias Norte, 225 - Campus da USP, CEP 13635-900. Pirassununga/SP- Brasil); <sup>4</sup>FCFRP/USP, Faculdade de Ciências Farmacêuticas de Ribeirão Preto (Av. do Café s/n - Monte Alegre 14040-903. Ribeirão Preto/SP – Brasil).

## ABSTRACT

*Staphylococcus aureus* and *Listeria monocytogenes* are important foodborne pathogens that must be controlled by the food industry. These bacteria can colonize food-processing plants, and persist for long periods even when appropriate hygiene measures are in place, and may be an important source of product contamination. São Paulo University, Federal University of Goiás and the Technical University of Denmark are carrying out a collaborative project which, in part, aims at determining presence and persistence of *S. aureus* and *L. monocytogenes* in frescal minas cheese processing. Two plants in the state of Goiás, Brazil, were visited once (dairy A) or twice (dairy B) in 2014. A total of 89 samples were taken from raw materials, product and the processing environment. Samples were kept cool and transported to the laboratory and analyzed on the same day of sampling. Samples were plated on Baird Parker agar and presumptive *S. aureus* colonies verified using the coagulase test. *Listeria* spp. were isolated following a two-step enrichment procedure and plating on selective agar. Isolates were sent to Denmark and 16S rRNA gene sequencing used to identify the pathogens. *S. aureus* was isolated from 16 out of 29 samples collected in Dairy plant A: brine (1), cheesecloth mold (1), mixing paddle (1), processing tank (1), washbowl (1), floor (1) and wall from processing room (1) as well as from the final product (9). At dairy B, *S. aureus* was isolated only from three of 60 samples: unpasteurized buffalo milk (2) and at the clean gallon used for transporting milk (1). *L. monocytogenes* was not isolated at any of the samplings but at plant B, *L. innocua* (confirmed by ApiListeria), was detected in food and in processing area sites. These results can help us to understand the hot spots for the studied pathogens in dairy processing plants.

**KEY WORDS:** *Staphylococcus aureus*, *Listeria monocytogenes*, dairy plant

**Development agencies:** Fundação de Amparo à Pesquisa do Estado de São Paulo (#2012/50507-1); Fundação de Amparo à Pesquisa do Estado de Goiás (#2012/10267001047); Innovation Fund, Denmark (#12-131410 - MixedBiofilms).