Title: Enterotoxigenic potential of *Staphylococcus aureus* isolated from clinical mastitis

Authors: [1]Rossi, B.F.; [1]Bonsaglia, E.C.R.; [1]Campos, F.C.; [1]Dantas, S.T.A.; [1]Castilho, I.G.; [1]Orsi, H.; [2]Gonçalves, J.L.; [2]Santos, M.V.; [1]Rall, V.L.M.

Institution: [1]Department of Microbiology and Immunology, Institute of Biosciences of Botucatu (IBB) - São Paulo State University (UNESP), Botucatu/ São Paulo-Brazil.

[2]Department of Animal Nutrition and Production, School of Veterinary Medicine and Animal Science, University of São Paulo (USP), Pirassununga/ São Paulo-Brazil.

Abstract:

Clinical mastitis caused by *Staphylococcus aureus* is the most prevalent disease in dairy herd in Brazil. In clinical mastitis, pathological signs are apparent, such as udder swelling and the presence of pain, in addition to the changes also visible in milk. This species can produce superantigens (SAgs) that delay the immune response, increase pyrogenicity and enhance the toxic effects of endogenous endotoxin and they also participate in the establishment of infection by providing an attractive environment for colonization. The staphylococcal enterotoxins (SEs) plays an important role in the development of mastitis and more than 20 types were described. Classic SEs (SEA, SEB, SEC, SED and SEE) are responsible for 95% of cases of staphylococcal food poisoning. Besides that, some genes encoding these enterotoxins are involved with higher or lower frequency of mastitis. The genes that encode the SEs are in mobile genetic elements, such as plasmids which is an advantage for the microorganism because it allows the mobility of the molecule, increasing its ability to cause disease. Thus, the aim of this study was to evaluate the presence of the genes that encodes SEA, SEB, SEC, SED, SEE, SEG, SEH, SEI and SEJ enterotoxins in strains of *S. aureus* isolated from cows with clinical mastitis in the state of São Paulo. A total of 103 *S. aureus* strains were identified due to the presence of the *nuc* gene using the Polymerase Chain Reaction (PCR) assay, also used to analyze the presence of the genes for the SEs. The results showed that 71% of the strains had at least one of the genes for the production of enterotoxins. The most prevalent gene was for SEH, appearing in 50% of the strains, followed by SEG and SEI (21%), SED (2.06%) and SEC (1.03%). We did not find *sea, seb* and *see* genes. The results show that the control of the disease and the prevention of the spread of this pathogen are very important because the preformed toxins in milk can resist to high temperatures, causing foodborne disease.