

## ARABIC GUM, A NEW STRATEGY FOR MICROBIOLOGICAL CONTROL IN THE DAIRY INDUSTRY

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The nutritional quality loss of food, usually is caused by microbial growth during different stages of production. Particularly in raw milk, the initial microbial content will affect the quality, shelf life and safety of processed milk and its derivatives. Traditionally, one of the strategies most used for reducing the risk of microbial contamination of raw milk, is storage under refrigeration immediately after to milking. However, this selectively favor the development of psychrotrophic microorganisms that can produce heat stable extracellular enzymes, causing alterations in the chemical composition and nutritional value of milk. In the last decade, the demand for minimally processed, easily prepared, and ready-to-eat fresh food products has grown globally, prompting the development of new methodologies as alternatives to thermal treatment. A growing trend is the addition of preservatives of natural sources, as a safe and healthy alternative to synthetics preservatives. The Arabic Gum (AG) is an edible biopolymer obtained as exudates of trees of *Acacia*, which is being widely used as a stabilizer, a thickener, and an emulsifier. However, to date, no antimicrobial activities studies have been conducted against psychrotrophics microorganisms. The aim of this work was to evaluate the effect of the addition of AG over the psychrotrophics bacterial growth, and viability. Several bacteria isolated from raw milk (*Enterobacter* spp.) were cultivated with different concentration of AG (0, 10, 20, 75, 100, 200, 400  $\mu$ M) during a period of 7 days at 4°C and analyzed each 24 h. The bacterial growth in different conditions was evaluated by CFU counts, viability assays was performed using the LIVE/DEAD BacLight Bacterial Viability Kit (FACS), and metabolic activity was determined by colorimetric assay using tetrazolium salt (MTT). We observed that the addition of 200 and 400  $\mu$ M AG controlled proliferation of bacterial growth in more than a 50%, respect to the control condition and these effects were dose-dependent. In another hand, AG did not show significantly effect on the bacterial viability evaluated by the incorporation of propidium iodure. However using the tetrazolium salt as MTT we could determine that 75, 100, 200 and 400  $\mu$ M of AG were able to inhibit the metabolic activity of psychrotrophics bacterial growth significantly in all the assayed times. These data shown that AG had an important effect in the initial proliferation over psychrotrophic bacterial milk, which was maintained during analyzed times. Is important to highlight that, for dairy factory the initial times are determinants to conserve the milk quality up to industrial processing, improving nutritional value in the final product. In base of these results, we can suggest that AG provides an additional beneficial effect to their usually technological use in food industry.