



TAL 797 – Seminar

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**AUTOCHTHONOUS LACTIC ACID BACTERIA AND THEIR ADAPTATION TO
SUBLETHAL STRESSES FOR THE DEVELOPMENT OF STARTER CULTURES WITH
GREATER THERMAL RESISTANCE**

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Artisanal cheeses, produced through spontaneous fermentation of unpasteurized milk, are globally appreciated for their unique sensory characteristics and deeply rooted cultural tradition spanning centuries. This is due to its rich and diverse microbiota of lactic acid bacteria. In this context, the preservation of this endogenous microbiota is crucial for the development of new products such as signature cheeses, as well as providing specific attributes and making it possible to apply them to cheeses from different geographic regions and in the dairy industry. Starter cultures are supplied to the dairy industry as powdered concentrates, achieved through either freeze-drying or spray-drying, facilitating direct application into fermentation tanks. Autochthonous lactic acid bacteria play a significant role in dairy food production, contributing to flavor, texture, vitamin synthesis, and digestibility, thus ensuring overall quality. Preservation of these essential cultures can be accomplished through lyophilization or spray-drying. The application of sublethal stresses can enhance microbial resistance to dehydration, as cells undergo pre-adaptation to stressful conditions. The use of spray dryers in the production of commercial starter cultures for the dairy industry has shown promise. This strategy ensures the viability and stability of lactic acid bacteria used for the production of fermented dairy products. Among the advantages, we can mention scalability, reduced production costs, lower energy consumption, and, in some studies, the possibility of storage at room temperature. Nevertheless, certain strains are sensitive to spray-drying due to exposure to thermal, oxidative, and osmotic stress conditions during the dehydration process. However, there are strategies that can be applied to optimize the process. Thus, prior exposure to sublethal stresses can significantly increase cell tolerance during adverse situations, improving cell viability of commercial starter cultures. The spray-drying dehydration process of autochthonous lactic acid bacteria can offer advantages in terms of local adaptation, sustainability, and cost reduction for the dairy industry.

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