

Lactic acid bacteria in preservation and improvement of nutrients In fermented foods

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Abstract

Fermented foods have been consumed over the years by humans and their nutritional and functional aspects are of interest for the development of innovative foods with different added-values (Marco et al., 2021). The biochemistry defines fermentation as “an ATP-generating process in which organic compounds act as both donors and acceptors of electrons” (Kim and Gadd, 2019) however, considering the food producing process, fermentation is characterized by the activity of intentional microorganisms that produce desirable characteristics. Thus, fermented foods are “foods made through desired microbial growth and enzymatic conversions of food components” (Marco et al., 2021) that present an intrinsic and complex microbiota, usually mainly composed by lactic acid bacteria (LAB) and yeasts. In addition, other microorganisms, such as acetic acid bacteria and filamentous fungi, may be also found.

The microbiota of fermented foods may be modulated from one sample to another depending on several factors which includes, but it is not limited to, the raw materials, pH, water activity (A_w), temperature of fermentation and by the initial microbial community itself. In this way, fermenting food using wild starter cultures such as those ones found, for example, in kefir grains or sourdough will hardly address the same microbial and biochemical compositions.

Many studies have been evolved regarding the technological and functional aspects of these microorganisms aiming to develop fermented foods with sensorial, nutritional, and healthy attributes able to meet the expectation of consumers (Albuquerque et al., 2020). In addition, considering that the point of view of the consumers about eating more natural foods has increased, studying the safety aspects of fermented foods is also another role played by some microorganisms that can be explored to avoid using chemical food preservatives.

Lactic acid bacteria are among the microorganisms that have been most studied by their technological and functional aspects. They are an extended group of Gram-positive, non-spore forming, aerotolerant microorganisms that can be classified as homolactic or heterolactic depending on the lactic acid production generated from their carbohydrate metabolism. Lactic acid bacteria have been historically defined as GRAS, which means that they are generally recognized as safe, according to Food and Drug Administration guidelines. The EFSA - European Food Safety Authority also considers the safety history of lactic acid bacteria including them in the list of QPS – qualified presumption of safety.

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Biography

Marcela Albuquerque is food microbiologist, PhD in Sciences, and she has been studying the technological and functional aspects of lactic acid bacteria (LAB) during the last 13 years aiming the development of foods with high nutritional and health-added values. She founded the company NEPP – Center for Studies in Probiotics and Prebiotics (RJ, Brazil) where she coordinates scientific consulting projects with private and academic institutions. Her research topics are mainly about the production of B group vitamins and

proteolytic activity of LAB to improve nutritional properties of fermented foods as well as the safety aspects of foods exploring natural preservation strategies by using LAB-fermentation. Aiming to summarize her academic and professional career and background contributing to prospect the related LAB topics to the industry and scientific communities, she published the book “Lactic Acid Bacteria: a functional approach” (CRC PRESS, FL, USA) in 2020.