



Fermentation – from food industry by-products valorization to neurotransmitters production

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Lactic acid bacteria (LAB) are employed as a biotechnological starters to improve the safety and functionality of food and feed, to provide added value and to increase safety of food industry by-products, to design synthesis of functional molecules in fermentable substrates, to moderate the technologies for safer alternative stock incorporation to the main food formulas, to perform conversion of microalgae to valuable molecules possessing neurotransmitters characteristics. The addition of starter cultures under controlled conditions is a highly prospective technology for sustainable food and feed materials preparation. Metabolites of the LAB as well as viable LAB cells in fermented materials leads to desirable changes in mammals digestive tract microbiota *in vivo*. Additionally, the high-functionality fermented food ingredients can be produced by applying LAB for the food industry by-product valorization. Also, fermentation with LAB greatly contribute not only to the flavour, aroma, and texture of the final product but also to functional molecules synthesis, e.g., galactooligosaccharides can be synthesized from the dairy industry by-products containing lactose; gamma-aminobutyric acid (GABA) can be produced from the substrates containing L-glutamic acid (e.g., Spirulina). Additionally, LAB can excrete precursors (L-glutamic acid) for further GABA production *in vivo*. This type of bioconversion is a very promising technology for food, feed, nutraceuticals, pharmaceuticals, and supplements production. Finally, our works showed, that LAB application in industry is extremely broad: from food industry by-products valorization to neurotransmitters production.

Keywords: Lactic Acid Bacteria; Industrial Biotechnology; Fermentation.

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