**Editorial**
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# Novel Perspectives in Food Fermentation

**Ravi Kumar Chennupati***

*Department of Biotechnology, Rvr & Jc College of Engineering, Guntur, India*

## Editorial

Food fermentation has been utilized for food preservation for thousands of years. Consumers already value fermented foods because of the high-quality standards reached and the improvements in nutritional and organoleptic features. The quality and safety qualities of these goods can be affected by production procedures, raw material types, microbial cultures, and other factors. Fermented foods contain a diverse range of microorganisms, and microbial succession throughout fermentation and ripening helps to the desired qualities of these meals. Microorganisms found in fermented foods can have a good impact on people's health due to their possible probiotic nature and the synthesis of beneficial metabolites such as vitamins and antioxidant compounds, in addition to the sensory and safety elements.

The goal of this Special Issue was to expand current knowledge on advanced approaches to food fermentation by bringing together studies on traditional and unconventional food matrix fermentation, functional compounds obtained through fermentation, fermentations that improve quality and safety standards, and papers presenting novel approaches to understanding the microbial community that characterises fermented foods.

Although novel techniques to food fermentation have piqued the interest of researchers and industry, many foods are still produced using traditional methods. Innovative technological and biological processes, as well as fresh research methods, work together to bring traditional foods into modern diets and to open up new possibilities for the fermentation of unusual substrates and food byproducts. The three functional food papers that were submitted all dealt with concerns relating to fruit and cereal fermentation. The addition of four different potential probiotic strains to date fruit-based fermented products (*Lactiplantibacillus plantarum* subsp. plantarum ATCC 14917, *Lactobacillus delbrueckii* subsp. bulgaricus ATCC 11842, *Lactobacillus acidophilus* ATCC 4356, and *Lacticaseibacillus rhamnosus* ATCC 7469) was evaluated in an Italian study (extruded snacks). Changes in the polyphenol profile, such as enhanced free phenolic compounds and associated activity, were identified after fermentation. These findings could be explained by lactobacilli metabolism, which catalyses the release of bioactive chemicals from the matrix as well as the modification of polyphenolic composition in favour of more bioaccessible molecules. When the snack was fermented with *L. rhamnosus*, the beneficial effects were more noticeable. The fermented snack, according to the scientists, might be suggested as a prototype of functional food, primarily for athletic nutrition and supplementation [1-5].

The effect of adding lipase to suanzhayu, a traditional Chinese solid fermented fish product made by blending rice powders with seasonings and fresh fish meat in a sealed lengthy fermentation environment. Lipase had minimal influence on the microbiome's structure, but it did enhance Proteus growth and the generation of VOCs, particularly aldehydes and esters. Lactobacillus, Enterococcus, and Proteus all had a part in the product's safety, blocking the potentially harmful *Escherichia-Shigella* bacteria, according to the correlation study. The addition of lipase to suanzhayu could be a creative way to improve its quality. Finally, the last research looked at the effects of lactic acid fermentation on the aromatic profile of *Arthrospira platensis* biomass, which is frequently employed in food formulations and mostly consumed as a food supplement due to its high nutritional value. Prior to solid-state fermentation using *Lacticaseibacillus casei* 2240 and *Lacticaseibacillus rhamnosus* GG, the biomass was subjected to two distinct stabilisation methods (UV light treatment and sterilisation). The fermenting technique proved effective in reducing off-flavors. The concentration of chemicals responsible for aldehydic/ethereal, buttery/waxy (acetoin and diacetyl), alkane, and fermented aromatic notes was greatly altered by the fermentation process (isoamyl alcohol). Fermenting spirulina powder with LAB can be a fun way to get a more pleasant-tasting lyophilized spirulina powder for use as a food supplement.

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***Address for correspondence:** Ravi Kumar Chennupati, Department of Biotechnology, Rvr & Jc College of Engineering, Guntur, India; E-mail: ch.ravikumar@yahoomail.com*

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