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Probiotics and their health benefits

Probiotics are well known for their effective health benefits to their host and have gained significant attention for their role in maintaining gut health and overall well-being. Among the various groups of probiotics, lactic acid bacteria (LAB) are particularly noteworthy for their prevalence in fermented foods and their ability to produce lactic acid through carbohydrate fermentation. This metabolic pathway of LAB not only enhances food preservation but also contributes to the competitive inhibition of pathogenic bacteria in the gut. A comprehensive understanding of LAB involves the application of various biochemical tests to characterize their metabolic capabilities and identify various species and specific strains. Screening and identification of LAB includes Gram's reaction, catalase activity, carbohydrate fermentation, homo- and hetero-lactic acid fermentation, tolerance to temperature and pH, osmotic stress tolerance, bile salt hydrolase activity, citrate utilization, nitrate reduction activity etc., and molecular identification. The LAB will be assessed for their probiotic attributes such as tolerance to acid and bile salts, sensitivity to antibiotics, antimicrobial activity, resistance to phenol, cell surface hydrophobicity and in vitro adhesion to epithelial cells, auto-aggregation capabilities, and survival abilities in simulated gastric juice. Further safety evaluation of the LAB isolates includes, DNase activity, hemolysis activity, antioxidant assays, and cytotoxicity assays. Probiotics from fermented food products offer a holistic approach to promoting health through nutrition enhancement, dietary microbiome diversity, natural preservation, and cultural sustainability and significance. These insights support on the selection of effective probiotic strains for therapeutic applications and opens avenues for the development of novel functional foods aimed at promoting gut health.

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