Developing Effective Delivery Systems of Beneficial Bacteria in Food Products

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Introduction

Foods commonly contain an expansion of bacteria of which some can be beneficial, which includes the ones keeping foods thru merchandise of fermentation, and others can be harmful through inflicting human illness or food spoilage.

Abstract

Nowadays there is a growing interest in developing novel functional foods containing probiotic microorganisms. To deliver the health benefits, probiotic products need to contain an adequate amount of live bacteria capable of surviving the acidic conditions of the upper gastro-intestinal tract, as well as proliferating in the intestine, a requirement that is not always fulfilled. To overcome such deficiencies, immobilization techniques have been developed, aiming at stabilization of cells and formulation of new types of foods fortified with immobilized health-promoting bacteria that are only released upon reaching the human gut. In this vein, immobilization of probiotic cells on natural, food-grade, prebiotic dietary fibres was studied. As it is important to develop approaches that are compatible with the use of dried cultures, a technology which accommodates its use by the industrial and commercial sector, the wet immobilized cultures were then subjected to drying processes (freeze- and thermal-drying) and the survival rate after the drying procedure and during storage at room and low-temperatures (4 and -18oC) for various time periods (up to 1 year) were studied. Cell immobilization enhanced cell viability and extended the shelflife of pro-and pre-biotic fortified foods, as documented by microbiological and molecular analysis. The probiotic strains were encountered at levels greater than 7 logcfu/g after 2 and 12 months of storage at ambient and low temperatures, respectively, and can also withstand high temperature processing steps (up to 60oC) with no significant loses. Our process resulted in successful dried immobilized probiotic culture preparations appropriate for many food applications that maintained cell viability during storage for time periods suitable for industrial uses. Lactic acid bacteria are the various most critical companies of microorganisms used in meals fermentations and are largely protected inside the genera Lactobacillus, Carnobacterium, Enterococcus, Lactococc Leuconostoc. Oenococcus, Pediococcus, Streptococcus, Tetragenococcus, Vagococcus and Weissella. The essential function of lactic acid microorganism metabolism is green carbohydrate fermentation coupled to substrate-stage phosphorylation. These bacteria can degrade a variety of carbohydrates, with lactic acid being the important cease product. Many lactic acid microorganisms additionally produce bacteriocins which have antimicrobial activity that is hostile to other microorganism, particularly toward microorganism closely related to the bacteriocin-producing strain. Bacteriocins are peptides that are produced ribosomal through microorganism and launched extracellular. Starter cultures, which are largely constructed from lactic acid microorganism, are mealsgrade microorganisms that are used to supply fermented meals of suitable look, frame, texture, and taste. Types of fermented foods for which business starter cultures are currently used include dairy merchandise (cheese, sour cream, and yogurt), meat products (sausages), and vegetable products (pickles, sauerkraut, olives). For starter cultures to be effective all through meals fermentations, they have to dominate over naturally occurring microflora and produce the favoured end merchandise of fermentation. Many of the activities crucial for food fermentations, which include lactose metabolism. proteinase pastime, oligopeptide shipping, bacteriophage-resistance mechanisms, bacteriocin manufacturing and immunity, bacteriocin resistance, exopolysaccharide production, and citrate usage, are encoded on plasmids harbored via lactic acid bacteria. Advances in molecular technology have enabled the construction of advanced lines of starter cultures for food fermentations. Improved functions of these lines include bacteriophage resistance, genetic stability, and reduced variation and unpredictability in performance. Another utility for useful microbes utilized in ingredients is including probiotic microorganisms to offer a health benefit to customers. Many beneficial health outcomes for probiotics have been stated and encompass protection towards enteric pathogens, progressed digestion through enzymes to metabolize otherwise indigestible food nutrients (e.g., lactase to hydrolyze lactose in lactose intolerant clients), stimulation of the intestinal immune device, and development of intestinal peristaltic hobby. Lactic acid bacteria are the most not unusual kinds of probiotic microbes getting used. Probiotics have been largely added in fermented meals which include yogurt and fermented milk products; but, growing consumer hobby in probiotics is main to using other sorts of ingredients consisting of fruit and vegetable juices, cereal-primarily based products, or even ice cream, as transport cars. Fermented foods are an essential part of the meals processing industry and of many purchasers' diets and are in large part produced by way of lactic acid bacteria which have been selected for his or her ability to provide preferred merchandise or changes inside the food. Many advances had been made all through the beyond decade in growing stepped forward bacterial strains for starter lifestyle application, which in large part have been made feasible thru advances in molecular technology. The use of lactic acid microorganism to beautify the satisfactory and protection of ingredients is a hastily evolving area. With the discovery of recent bacteriocins and the development of more efficient tactics to deliver them to meals, the significance of lactic acid microorganism in keeping and presenting stronger protection of food will preserve to boom for the foreseeable future. Good bacteria, additionally called probiotics, are similar to bacteria that are living naturally in your body. Probiotics may be beneficial in your fitness, and they're to be had in yogurt or in various dietary supplements. Probiotics have additionally been formulated into suppositories and creams for specific use of. Although there is a few medical proof that the distinctive styles of desirable bacteria can deal with sure scientific situations, you have to not use probiotics or every other nutritional supplement without first consulting your medical doctor. Bacillus coagulants can be useful within the remedy of gastrointestinal problems consisting of diarrhoea related to an antibiotic regimen, vacationer's and kid's diarrhoea, inflammatory bowel ailment and irritable bowel syndrome. The supplement will also be beneficial in preventing breathing infections and improving their immune response. However, Natural Medicines Comprehensive Database has concluded that there's "Insufficient Evidence to Rate the Effectiveness" of Bacillus coagulants for any of those healing programs