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Commentary

Advancement on Probiotics to Create Human Health Promoting Free Fatty Acids

Heen Zhou*

Department of Microbiology, Zhejiang University, Zhejiang, China

DESCRIPTION

Live bacteria known as probiotics have the potential to improve health when ingested in sufficient quantities. For more than 15 years, communities in Kenya and Tanzania have benefited from probiotic yogurt enriched by *Lactobacillus rhamnosus* GR-1 thanks to the non-profit Fiti program. The acceptance for non-dairy Fiti probiotic supplements created in earlier studies is evaluated in this study. Fiti probiotic goods are made without dairy and include millet porridge and fruit juices including mango, pineapple, and orange juice. In addition, 140 people from Mwanza, Tanzania, and Juja, Kenya, participated in a sensory evaluation to rate these samples on the basis of appearance, color, texture, smell, taste, and general acceptability.

Taking probiotics has been shown to have a number of health effects; however, their effectiveness is contingent upon their capacity to remain viable during manufacturing and digestion. Multiple coats may be required since probiotic survival can be harmed by freeze-drying, encapsulation, storage, and digesting. This adds to the complexity and expense of production. The excellent survivability of the probiotics was validated by objective studies, which also revealed their encapsulation within $CaCO_3$. Probiotic viability is efficiently maintained by this suggested technology throughout the process of encapsulation and freeze-drying procedures, with little to no cell loss. Furthermore, under conditions that mimicked the stomach and intestines, CSCPs showed remarkable viability performance. Remarkably, all of these microbes made it into the intestines and delivered more than 10 billion live Colony-Forming Units (CFUs) of probiotics. The prospect of CSCPs to be a workable approach to surmount probiotic encapsulation obstacles and maximize therapeutic advantages.

Functional lipids having health-promoting qualities, such as omega-3 fatty acids, linoleic acid, and short-chain fatty acids, are produced by many probiotics. It has been demonstrated that they have antioxidant and anti-inflammatory effects, support intestinal barrier integrity, and preserve gut health. We present a current overview of the many types of functional lipids that probiotics create in this article. These probiotics can be employed in industrial biotechnology procedures to make functional lipids that are then separated and used as ingredients, or they can be added to foods, supplements, or medications to induce the human colon to produce these lipids. The various physiological processes for which probiotics may be advantageous to human health are then highlighted. Some difficulties encountered when integrating probiotics into commercial goods are also covered, along with possible solutions. The significance of evaluating the current generation of probiotic-enhanced drugs for safety and efficacy, as well as the enormous potential for associated product commercialization.

Tablets are one of the most widely utilized types of probiotic delivery. Probiotics are live bacteria recognized for delivering health advantages through the enhancement or regeneration of gut flora. Making sure the probiotics in the tablets are viable is an important aspect of quality. However, because of potentially fatal mechanisms, ensuring probiotic health during tableting is difficult. Therefore, when creating probiotic tablets, it is essential to comprehend the deadly mechanisms underlying and identify practical prevention measures. Effective preventive measures to lessen their effects throughout the development of formulations and the tableting procedure. Important strategies include excipient selection, probiotics/excipients ratio, compression speed/pressure/profile, and formulations design and process optimization. This research attempts to offer a useful guidance for the creation of probiotic tablets by summarizing these deadly mechanisms and the accompanying prevention measures. Early microbiota and newborn health, particularly in premature infants, are intimately related. Probiotics have a significant role in the development of the gut microbiota in preterm newborns; nevertheless, opinions on the features of the particular microbiota in these infants are divided. The most significant changes in the gut microbiota of preterm newborns supplemented with probiotics was the improvement for Acinetobacter, Bifidobacterium, and Lactobacillus spp. and the decrease of potentially pathogenic bacteria, Finegoldia, Veillonella and Klebsiella spp. Probiotics induced a shift in the microbiome

Correspondence to: Heen Zhou, Department of Microbiology, Zhejiang University, Zhejiang, China, E-mail: Heenzhou@32gh.ac.cn

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of several preterm gut community types. Notably, type 3 preterm gut communities showed the most α-diversity, with an enrichment of *Bacteroides* spp. and *Bifidobacterium*. In preterm infants fed with probiotics, the primary expected microbial processes involved in peptidoglycan production consistently increased at the functional level, while the critical pathways linked to the biosynthesis of heme consistently declined. Remarkably, when mixed probiotics were given to premature newborns, *Bifidobacterium* sp. instead of *Lactobacillus* sp. gradually took over the gut microbiota, despite the fact that both probiotic strains received the same dosage. When considered as a whole, our meta-analysis indicates that probiotics may help modify the ecosystem of microbes of preterm newborns by altering the bacterial community's taxonomic and functional levels. To better understand the relationship between probiotics, gut microbiota, and disease risk, more standardized and pertinent research may be conducted. This will allow for the early provision of nutritional feeding guidelines to preterm newborns.