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Evaluation of shelf life of standardized prebiotic and probiotic products

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Abstract

The present study was done on “Evaluation of shelf life of standardized prebiotic and probiotic products.” In the industrialized world, functional foods have become a part of an everyday diet and are demonstrated to offer potential health benefits beyond the widely accepted nutritional effects. Currently, the most important and frequently used functional food compounds are probiotics and prebiotics, or they are collectively known as ‘synbiotic’. Moreover, with an already healthy image, dairy products appear to be an excellent mean for inventing nutritious foods. Such probiotic dairy foods beneficially affect the host by improving survival and implantation of live microbial dietary supplements in the gastrointestinal flora, by selectively stimulating the growth or activating the catabolism of one or a limited number of health-promoting bacteria in the intestinal tract, and by improving the gastrointestinal tract’s microbial balance. These weaning foods are fermented food, which are easily digestible and makes the environment of gut applicable for microorganism to grow, which confers benefits upon host well-being and health.

Keywords: Gastrointestinal, synbiotic, flora, microorganism

Introduction

Nutraceuticals and functional foods have become an important tool for consumers to manage their health and wellness. Pre-, pro-, and synbiotic are a part of this group of products shown to have properties that can modulate gastrointestinal problems and improve general health and well-being. Prebiotics are polysaccharides that can withstand acidic and enzymatic digestion in the small intestine and can be utilized by probiotics, and gut microflora, in the large intestine for their growth and activities that benefit the host’s health, e.g., by enhancing the immunity and mineral absorption, preventing colon cancer and other gastrointestinal diseases, and lowering cholesterol. Prebiotics, e.g., inulin, oligofructose, Oligolactose, and lactulose, occur naturally in many plants, or may be synthesized from starch or other carbohydrates using

appropriate enzymes. A number of plants from southern Thailand, e.g., palm fruit (*Borrassus flabellifer* L.), jackfruit (*Artocarpus heterophyllus* Lam.), young coconut (*Cocos nucifera* Linn.), rambutan (*Nephelium lappaceum* L.), jampadah (*Artocarpus integer* Merr.), and okra (*Abelmoschus esculentus* Moench.) contain a considerable number of polysaccharides that have been shown to have prebiotic properties. Prebiotics may be used as ingredients in functional foods, or may be presented as nutraceuticals in the form of capsules, tablets or powder, sometimes together with probiotic cultures.

Probiotic products may contain one or more selected microbial strains. Human probiotic microorganisms belong mostly to the following genera: Lactobacillus, Bifidobacterium, and Lactococcus, Streptococcus, Enterococcus. Moreover, strains of Gram-positive bacteria belonging to the genus Bacillus and some yeast strains belonging to the genus Saccharomyces are commonly used in probiotic products. Probiotics are subject to regulations contained in the general food law, according to which they should be safe for human and animal health. In the USA, microorganisms used for consumption purposes should have the GRAS (Generally Regarded as Safe) status, regulated by the FDA (Food and Drug Administration). In Europe, EFSA introduced the term of QPS (Qualified Presumption of Safety). The QPS concept involves some additional criteria of the safety assessment of bacterial supplements, including the history of safe usage and absence of the risk of acquired resistance to antibiotics.

Materials and Methods

The present investigation entitled “Evaluation of shelf life of standardized prebiotic and probiotic products.” was carried out to outlay the effect of probiotics as well as prebiotics among infants under the following heads:

1. Weaning food and its standardization
2. Sensory Characteristics
3. Sensory evaluation of developed product

Weaning food produced by sophisticated technologies is costly and is not within the reach of rural dwellers and low income earners in the urban cities. Sensory evaluation is an analytical method in which the human senses serve as a measurement tool to determine the quality and/or to describe the condition of a food product. It is a scientific discipline that analyses and measures human response to the composition of food and drink. appearance, touch, odor, texture, temperature and taste. This discipline requires panel of human assessors by whom the products are tested and responses are recorded by them. Food quality can be evaluated by sensory evaluation. Sensory quality is the combination of different sense of perception coming into play in choosing and eating a food. Appearance, Flavor, and mouth feel decides the acceptance of the product. The different products developed by using different combination of prebiotic rich food in milk were prepared and were put forward for the next phase of the study i.e, for the sensory evaluation for identifying the best acceptable product. Codes T1, T2, T3 were allotted to different forms of weaning food developed respectively. Then a 9 point hedonic scale was prepared.

Result and Discussion

Prebiotics function is to increase our gut healthy bacteria groups such as Bifidobacterium and lactobacillus. Food containing probiotics (bacteria) and prebiotics (fermented fiber) are called symbiotic food because a component stimulates the activity of the other, being twice effective. This fermentation process feeds beneficial bacteria colonies (including probiotic bacteria) and helps to increase the number of desirable bacteria in our digestive systems that are associated with better health and reduce disease risk. The protein content of the controlled product was 3.1 gm while the experimental product had comparatively lower amount of protein was 2.93 gm.

The colonic microflora is important to health. The growth and metabolism of the many individual bacterial species inhabiting the large bowel depend primarily on the substrates available to them, most of which come from the diet^[1]. This has led to attempts to modify the structure and metabolic activities of the community through diet-using probiotics and Prebiotics. Probiotics are live microbial food supplements. The best known are the lactic acid bacteria and Bifidum-bacteria, which are widely used in yoghurts and other dairy products. These organisms are non-pathogenic and non-toxicogenic, retain viability during storage, and survive passage through the stomach and small bowel. Prebiotics are non-digestible food ingredients which selectively stimulate the growth or activities, or both, of lactobacilli or bifidobacterial in the colon, thereby improving health. There was significant difference with carbohydrate, energy content of experimental product and control product, the carbohydrate of the control product 3.0 gm while the experimental product 3.58 gm.

Summary and conclusion

Summary

It has been found in the present investigation that dietary elevation of plasma cholesterol levels can be prevented by the introduction of a *L. acidophilus* strain that is bile resistant and assimilates cholesterol. These findings were supported by Pereira & Gibson (2002) who demonstrated that probiotic strains were able to assimilate cholesterol in the presence of bile into their cellular membranes. The existing studies from animal and human studies which detected that moderate cholesterol lowering were attributable to the consumption of fermented products containing probiotic bacteria. Also showed cholesterol removal by Bifidobacterium spp. and *L. acidophilus*. The possible mechanisms of action of probiotics are cholesterol assimilation by bacteria, deconjugation of bile salts, cholesterol binding to bacterial cell walls, and reduction in cholesterol biosynthesis (Pulusoni & Rao, 1983; Pereira & Gibson, 2002). Prebiotics function is to increase our gut healthy bacteria groups such as Bifidobacterium and lactobacillus. Food containing probiotics (bacteria) and prebiotics (fermented fibre) are called symbiotic food because a component stimulates the activity of the other, being twice effective. This fermentation process feeds beneficial bacteria colonies (including probiotic bacteria) and helps to increase the number of desirable bacteria in our digestive systems that are associated with better health, reduce disease and better digestive system.

Conclusion

In this research work mainly three weaning foods were developed with different compositional values of milk and starch weaning food i.e., Milk(120ml), starch (30ml), Milk and bread weaning food, Milk(120ml), bread (3 slice), Milk, fruits pulp weaning food, milk (120ml), fruits pulp (56g). Highly accepted weaning food is milk and starch weaning food among the three products. Weaning is mainly recommended to infant (6 months to 2 year) their protein, carbohydrate, fat and vitamin C necessary for digestion, growth and development, healthy gums and prevents from common cold and various viral infections.

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