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The necessity of probiotics as an alternative to chemical preservatives to preserve food products

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Abstract

Preservatives are in particular useful to grow the shelf-existence of food employing spoilage prevention. However, most kinds of preservatives used these days are artificial as opposed to natural. Most of the preservatives are toxic and can be the reason of life risk. According to different findings, artificial preservatives ought to purpose critical fitness risks consisting of hypersensitivity, bronchial asthma, hypersensitivity, neurological damage, and most cancers. This study is intended to correlate the useful results of unique probiotics via replacing pretty dangerous chemical preservatives on the production of numerous meals merchandise and formulating enormously higher upkeep practices in the food enterprise, primarily by observing the outcomes of the test. Probiotic bacteria have emerged as very popular inside the ultimate too many years because of their scientific blessings to human fitness. As a result, they were carried out in diverse food products within the food enterprise, confirming the fine keeping first-rate of those products and making sure proper health.

Keywords: probiotic, chemical preservative, probiotic benefits, impacts of preservatives

Introduction

Preservatives are substances that can be brought to diverse meals components to boom their shelf life and preserve their first-class safety via inhibiting contamination, discolouration, and enzymatic reaction (E.M. John, 2003) ^[23]. Meals and drug administration (FDA) regulates the number of food preservatives in meals to ensure protection. In keeping with their packages, there are many sorts of substances currently used as preservatives. Although some of those are harmless while utilized in minimal quantities, others are not without risks for human fitness. A sufficient quantity of facet consequences together with pores and skin rashes itching, breathing problems, gastrointestinal upsets can be observed (M.M. Silva and F.C. Lidon, 2016) ^[38]. The detrimental consequences of food preservatives are nausea, vomiting, diarrhoea and migraine, which occur especially in children (T. E. Tuormaa, 1994) ^[57]. Natural ways of preservation usually aim to exclude air, moisture, and harmful microorganism or provide favourable conditions for food production (M. Daniel, 2007). But nowadays, chemical preservatives show some adverse side effects. Some chemical preservatives are responsible for carcinogenic reactions. Because of various complications of chemical preservatives, presently new substances are implemented named probiotics which are highly beneficial to preserve food safely as well as to develop a health condition. Probiotics are living microorganisms that help maintain intestinal microbial balance and play a beneficial role in health (Mradula, 2016) ^[40]. Minor groups of pathogenic or disease-creating microorganisms, which are called Residual Flora', are always present in low numbers (Gedek *et al.* 1993) ^[16]. The human intestinal tract is a complete ecosystem that contains both facultative anaerobic, and aerobic microorganisms (Naidu *et al.* 1999). Probiotic bacteria fight against harmful microorganisms. The four most common probiotic species used in food products are *Lactobacillus*, *Leconostoc*, *Pedicoccus*, and *Streptococcus* (Von Wright, 2012) ^[61]. Lactic acid bacteria are known as one kind of common probiotic, which are very important as natural bio preservatives that provide antagonistic properties against the spoilage bacteria and pathogen (Cintas *et al.* 2001) ^[10]. When lactic acid bacteria compete for nutrient absorption, they produce metabolic compounds and antimicrobial products. Metabolites of lactic acid bacteria, including acidic compounds like acetic acid, lactic acid, hydrogen peroxide, and bacteriocins which are peptides in nature, act as a preservative for foods (Von Wright, 2012) ^[61] (Corfield *et al.* 2000) ^[12].

Using the bacteriocins producing lactic acid bacteria with effective techniques controls the growth of spoilage of microorganisms and inhibits their generation, growth, and bioactivity (Ananou S *et al.* 1996)^[2] (Cintas *et al.* 2001)^[10]. The beneficial effects of probiotics include intestinal health improvement, amelioration of the symptom of lactose intolerance, and lowering the risk of various diseases (M. M. Toma, 2006)^[33] (S. J. Salminen, 2005)^[487]. Probiotic foods are helpful in the human diet and have been produced and consumed since the development of human health. These confirm the good quality of food products and ensure long-lasting benefits.

Health benefits of probiotics

Probiotics have beneficial outcomes, as well as improve bowel function, enhance immune reaction, lower LDL cholesterol in the blood and prevent most cancers. Similarly, there may be sturdy evidence supporting the use of probiotics inside the remedy of severe diarrhoea and to enhance lactose metabolism. Probiotics are frequently used to treat sufferers with diabetes thru a balanced intestinal microbiome. Mainly probiotics along with *Lactobacillus acidophilus* and *Lactobacillus* conditions had been tested in mice towards fructose-triggered type 2 diabetes. Each microorganism was proven to have a great effect on reducing blood sugar (Yadav *et al.*, 2007). This shows that taking probiotics will reduce the prevalence of excessive blood pressure situations that can be directly related to diabetes. The prevalence of elevated LDL cholesterol levels is excessive in adults, youngsters, and kids. The main causes of hypertension are dyslipidemia, hypercholesterolemia, and weight issues (Yekeen *et al.*, 2003)^[64]. Studies have shown that probiotics are critical in decreasing excessive blood strain with the aid of decreasing the position of LDL cholesterol inside the blood, which includes the antioxidant capability of LDL (Goel *et al.*, 2006)^[17]. In laboratory experiments, numerous species of lactic acid bacteria (LAB) have shown anti-corrosion activity due to the fact they can bind to amines that can reason heterocyclic most cancers (Wollowski *et al.*, 2001)^[62]. Animal research has shown beneficial results of LAB on colon most cancer in mice. Execution research has additionally shown that certain types of lactobacilli have anti-most cancers outcomes due to their potential to lessen the interest of an enzyme called β glucuronidase (Brady *et al.*, 2000)^[6]. Lactose intolerance is an adult's lack of ability to digest lactose because of the lack of lactase, an enzyme that digests lactose. Excessive lactase deficiency in human beings is usually better tolerated in yoghurt than in milk. Microbiota of the small gut is notion to enhance lactose digestion through growing the interplay between lactose and lactose (Shah, 2000 and Farnworth, 2008)^[53]. Human beings have answered definitely to probiotic injections and physicians should now not regard it as an alternative treatment (M. de Vrese *et al.*, 2001)^[32] (KM Levri *et al.*, 2005)^[27]. Allergy reactions to meals are due to dietary antigens and are carefully related to intestinal sicknesses. Probiotics are beneficial in lowering the symptoms of anorexia nervosa due to the fact they improve the immune machine through the diffusion of way (non-immune and immunological). Probiotic microorganisms are had to correct inflammation associated with headaches in human beings with an allergic reaction response to food (Pohjavuori *et al.* 2004)^[45].

The liver and intestines have a wonderful working courting with the blood that flows from the intestines to the arteries of the portal. Liver volume is inspired via substances contained in the intestinal tract. Similarly, the last toxins produced using the liver affect bowel function. It is clear that any change inside the everyday structure of the intestine microbiota alters the systems of the liver and might cause the development and development of liver sicknesses (Cesaroa *et al.* 2011)^[9]. Probiotics are useful within the remedy of chronic liver disorder because they save you the access of microorganisms into the bloodstream to comply with the float and generally to the liver via the expanded ability of the intestines. (Cesaroa *et al.*, 2011)^[9].

Harmful effects of chemical preservatives

Food preservatives extend the period of food in grocery stores; however, they could have a complicated result on health. Preservatives are a critical factor for food producers due to the product being produced, shipped, and kept till purchase while not being dangerous, which means they do not lose money from spoiled food. Nevertheless, sometimes these chemical compounds may become undesirable and can have side effects on our body.

Sodium nitrate and nitrite are food preservatives often used to preserve various food products. The maximum use of nitrite as a food preservative represents various risks (Richard Cammacka *et al.*, 1999)^[46]. The US Agency of Environmental Protection indicates that the amount of consumption of nitrates can have a link with the risk of cancers, such as leukaemia, brain tumours, allergies, asthma, and skin rashes. Among the commonly used preservatives, most of these have hypersensitivity, and can be a cause of asthma and cancer (S.P. Anand and N. Sati, 2013)^[51].

Many people are exceedingly sensitive to sulfite and will revel in numerous symptoms, inclusive of dermatological, gastrointestinal, and respiration symptoms. As an example, if a person is sensitive to sulfites, they'll revel in skin irritations, hives, flushing, hypotension, abdominal pain, diarrhoea, and asthmatic breathing after consuming them (Hassan Vally and Neil LA Misso, 2012)^[21]. Sodium benzoate, or benzoic acid, is another most, not unusual preservative typically used to prevent the microbial increase in ingredients. The middle for science inside the public interest notes that those who are drastically touchy to sodium benzoate may additionally revel in allergies or antipathetic responses after consuming it. When it is mixed with Vitamin C, also referred to as ascorbic acid, sodium benzoate may be accountable for a small hazard of cancer, which includes leukaemia. According to the WHO, beast research screen that high boluses of the preservative may beget damage to the coronary heart, spleen, liver, feathers, brain, and adrenal glands. It is probably the feasible reason for the sodium benzoate of DNA harm (Malinee Pongsavee, 2015)^[35]. Sorbic acid is mixed with foods as antimicrobial preservatives. Reactions to sorbates are rare but have protected reviews of urticaria and contact dermatitis (J.L. Kinderlerer and P. Hatton, 1990)^[26]. Sorbic acid can be attained from rowan berries (*Sorbus aucuparia*) or may be chemically synthesized. This cumulative may be a gift in the form of tintless needles or white maquillages having a moderate characteristic scent (FAO, 2006)^[14].

Probiotic food products

Dairy probiotic products

The variety of foods having probiotic lines is normally extensive & nevertheless developing. Dairy ingredients, have performed important roles in people' diet, and there has been an increasing benefit of certain microorganisms. There are extra than 90 kinds of probiotic merchandise available globally, having one or more than one probiotics (Tharmaraj and Shah, 2003) [59]. The maximum commonplace products discovered within the market are specifically dairy-based as well as fermented milk, cheese, ice cream, buttermilk, powdered milk, and yoghurts (C. Stanton *et al.*, 2001) [8] (J. A. Ewe *et al.*, 2010) [25].

Yoghurt

In fermented milk products, yoghurt can be considered the most exoteric and crucial vehicle for providing probiotic microorganisms (C. Stanton *et al.*, 2001) [55]. It has lengthy been diagnosed as a product with many longing effects for someone who purchases items and services for non-public uses. It is also imperative that most consumers take into account yoghurt to be 'wholesome', as a bearer of probiotic microorganisms, like *L. acidophilus* and *B. bifidum*, and assume that could add greater nutritional and physiological values. Presently, yoghurt is known as "Bio-Yogurt", which has been prepared through stay probiotic lines in addition to the norm cultures, *S. thermophilus*, and *L. bulgaricus*, into yoghurt (Lourens-Hattingh A and Viljoen BC, 2001) [31].

Ice-cream and similar food products

Over the past many years, new forms of ice-cream products had been delivered to the requests, and probiotic societies evolved this merchandise into ice-cream merchandise. The probiotic cultures into ice cream led to blending cost to the ice cream product and being taken as a purposeful product, similarly to being rich meals. From the dietary factor of view, ice cream containing dairy-based cloth, nutrients, and minerals in its composition, in addition to probiotic cultures, enhances its nutritional properties (Awaisheh SS *et al.* 2005) [5]. Furthermore, various experiments have proven the boon of ice-creams as a medium for probiotic bacteria (Goff D, 2008) [18].

Cheese probiotic products

Cheese presents a high-priced opportunity choice as a food car for probiotics. An excessive protein quantity of cheese components probiotic bacteria with appropriate buffering safety in opposition to the high acidic kingdom inside the gastrointestinal tract, as a consequence enhancing probiotic bacteria's revival characteristic. Tender, semi-soft, and tough probiotic rubbish merchandise were advanced and retailed within the remaining regularly. Cheddar-like cheese became organized with the aid of using *B. infantis*. It became established that cheddar rubbish is a first-rate provider to deliver *Enterococcus faecium* into the gastrointestinal tract of a human being (Gillian E *et al.*, 2002) [19].

Non-dairy probiotic products

Although milk and milk-based products are the primary food companies for probiotic bacteria to human beings, a few obstacles of those merchandises, which includes the abundance of allergens, excessive lactose and LDL cholesterol contents, and the requirement for cold garage

facilities, have created the want to look for new probiotic product traces based on non-dairy substrates (Granato D *et al.*, 2010) [20]. Due to this, other products are being merchandised rather than the dairy products. (Granato D *et al.*, 2010) [20].

Chocolate probiotic products

Presently, the maximum giant traits in chocolate manufacturing originated from the client's demand for as a substitute fitness-selling chocolate which means chocolate that now not handiest does not adversely harm consumer health but also works as treatments or prevents ailments which include heart sickness, osteoporosis, most cancers, diabetes, and so forth. The operation of probiotic bacteria into chocolate could offer a splendid volition to everyday dairy products and increase the fitness claims of chocolate-grounded food products. (Aragon-Alegro LC *et al.*, 2007) [3]. latest market studies on purposeful foods show that digestive health turned into one of the maximum important factors of purchaser reputation concerning chocolate (Aragon-Alegro LC *et al.*, 2007) [3]. Several attempts have been made to create probiotic chocolate merchandise. Recently, a bar of chocolate become discovered by conducting probiotic components. Probiotic chocolate added an extra element in *L. paracasei*. It became displayed that chocolate was a crucial vehicle for the delivery of *L. paracasei*, as it increased probiotic microorganism's accrual and glance at some stages in chocolate processing and shelf life (Coman MM *et al.*, 2012) [11].

Future Probiotic Foods

Throughout the cutting-edge age, clients are progressively stronger with the aid of their non-public fitness and expect the meals they devour to be healthful or capable of prohibiting sickness. Gut health generally has been proven to be the important thing sector for useful foods. The brand-new generation of probiotics will surely be the important thing analysis and improvement space for future meals markets. Clients spontaneously obtain probiotics to defend food and flourish their fitness. In the last few years, the advantages of probiotic products have extended dramatically (Hoover, G. and Steenson, L.R., 1993) [23].

The viability and stability of probiotics have become a technological challenge for industrial producers. The technological desire for probiotic strains is fair, and new production methods and formulation technologies may typically need useful microorganisms. The packaging materials used in probiotic foods are necessary for the standard of the products. The oncoming technological prospects live in inventions chancing results for the perpetual state and immutable issues of probiotics in new food surroundings. Maintaining low production prices can be a challenge for future probiotic methods and formulation technologies. Exploiting food-graded raw materials such as native and enzymatically modified starches is an example of upcoming technology that has the potential function to accommodate the challenge. By broadening various types of foods probiotic technology will be able to create a desirable milestone in innovation food production technology (T. Mattila-Sandholm *et al.*, 2002) [58].

Conclusion

The significance of probiotics in nutrition due to the right health conditions is tested scientifically. Dairy materials still

are crucial compounds for the transport of probiotic microorganisms. As a result of meals technology advances and, consequently, the developing demand, probiotics are status out daily. The regulative status of probiotics as meals components has to be hooked up on a global stage with stress on efficacy, protection, and validation of fitness claims on food labels. There's absolute confidence that there could be a widespread growth inside the role of probiotics in nutrition and remedy within the next decade and need to be considered through scientific professionals and promoted via the food enterprise as their utility within the prevention and treatment of diverse disorders.

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Conflict of interest

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