

# Dietary Nourishment and Food Processing Techniques

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## Probiotic Foods Have Positive Effects on Health

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### Abstract:

Probiotics are live microorganisms that have positive effects on health. They are mostly present in fermented milk products. Likewise, there are various preparations on the market that contain cultures of microorganisms. Their role is to help the natural microflora to recover faster while they perform their functions. Intestinal flora consists of bacteria that help break down food, enable the synthesis of some vitamins, produce the enzyme lactase, are important in the work of the immune system, have a protective role as well as a role in body weight regulation. They prevent bad bacteria from sticking to the intestines, create bactericidal substances, and signal other cells of our body to destroy bad bacteria.

**Key Words:** Probiotics, Microflora, Microorganisms, Bacteria, Health

### Introduction

Probiotics are live microorganisms that bestow a useful impact on the have when managed in appropriate sums [1]. Their useful impacts on gastrointestinal contaminations, the lessening of serum cholesterol, the assurance of the resistant framework, anti-cancer properties, antimutagenic activity, anti-diarrheal properties, the change in provocative bowel infection and concealment of *Helicobacter pylori* disease, Crohn's infection, rebuilding of the microflora in the stomach and the insides after antibiotic treatment, etc. are demonstrated by expansion of chosen strains to food products.

### Microflora

Lactobacilli and bifidobacteria are ordinary components of the solid human intestinal microflora [1]. They are included in the composition of probiotics and probiotic foods since of their demonstrated health impacts on the body. They are the primary life forms that keep up the adjust of the gastrointestinal microflora.

Not all strains of lactobacilli and bifidobacteria can be utilized as components of probiotics and probiotic foods, but as it were those that are of human beginning, non-pathogenic, safe to gastric acid, bile and to the antibiotics, managed in therapeutic hone; they ought to too have the potential to follow to the intestine epithelial tissue and create antimicrobial substances; they ought to permit the conduction of mechanical forms, in which tall concentrations of reasonable cells are gotten as well as to permit mechanical development, embodiment and freezedrying and they ought to stay dynamic amid capacity. This requires the required determination of strains of the genera *Lactobacillus* and *Bifidobacterium* with probiotic properties. In addition, the concentration of reasonable cells of microorganisms in the composition of probiotics ought to

surpass 1 million per gram in arrange for the arrangement to display a restorative and prophylactic effect.

Along with probiotics probiotic microscopic organisms are most regularly included in the composition of dairy items - yogurt, cheese, etc.. A dairy item that conveys reasonable cells of *L.acidophilus*, *L.bulgaricus*, *Bifidobacterium* sp. is bio-yoghurt. Satisfactory numbers of reasonable cells, specifically the "therapeutic minimum" require to be devoured routinely for exchange of the "probiotic" impact to customers. This requires the utilization of 100 g per day bio-yoghurt containing more than 106cfu/cm3 practical cells.

The species *L.bulgaricus* is a heterogeneous gather of microbes, counting strains with probiotic properties. The consideration of such societies in yogurt would change this lactic acid item into a probiotic product.

Probiotic microscopic organisms are included as components of the starter societies for non-dairy foods. For each sort of non-dairy item strains that can develop in the food environment and contribute to the arrangement of the tactile profile are chosen. So in starter societies for rawdried meat items probiotic microscopic organisms that are able to develop in the meat environment are included; in soy fermented foods as components of the starter societies lactobacilli and bifidobacteria strains which can develop and duplicate in soy milk are connected; in natural product and vegetables and natural product and vegetable juices microorganisms with probiotic properties reasonable for this sort of food are used.

Some strains of lactobacilli with probiotic potential are utilized as components of sourdough in bread-making to expand the rack life and to move forward the quality and a few mechanical properties of the last product.

### Microorganisms

Enormous sum of microbial biomass occupies the stomach and the insides and goes with people all through their lives [1]. Living beings that are a portion of the gastrointestinal microflora, incorporate saprophytic, pathogenic and conditionally pathogenic microorganisms, enterobacteria, lactobacilli, lactic acid cocci, bifidobacteria. They involve a specialty in the stomach related tract and enter into complex connections both among themselves and with the have - man or creature. Depending on the composition of nourishment admissions the differences of species and the proportion between them changes altogether. Upon admissions of plant foods fermenting species prevail, whereas in meat dinner agents of the putrefactive microorganisms take the upper hand. Organisms change supplements in food in distinctive ways and discharge metabolites with assorted chemical nature. Through them the gastrointestinal microflora impacts the condition and the health of the body. A portion of the microflora that incorporates lactobacilli and bifidobacteria utilizes the substrates and shapes metabolites as a result of its crucial action through which it abuses and removes pathogenic and toxigenic microscopic organisms from the natural specialty. The debasement of supplements from the rot performed by pathogenic and toxigenic microorganisms, which incorporate the pathogenic genera *Clostridium* and *Bacteroides* leads to the arrangement of poisons and items of rot that repress the working of the life forms and cause infections. The adjust between these two groups of microorganisms decides to a impressive degree the wellbeing of the people. Numerous variables influence this adjust - the quality of nourishment, water and discuss, theneuro-psychological status and push, the social and individual cleanliness, the health and the utilize of drugs, antibiotics, etc. The age of the people moreover impacts the differing qualities of the microflora in the stomach and intestines.

Maintaining the right adjust between the species in the gastrointestinal tract is accomplished through the selection of useful greenery (lactobacilli and bifidobacteria) in the frame of concentrates of practical cells, known as probiotics, or in the composition of foods that can be enhanced with them.

Probiotics are organically dynamic arrangements containing tall concentrations of useful characteristic microorganisms that permit keeping up a transcendently advantageous microflora in the gastrointestinal tract, guaranteeing great health and quality of life. In the final decades, science and health care are paying genuine consideration to probiotics as preventive and restorative apparatuses against numerous illnesses. The to begin with useful impact of their selection is the normalization of the gastrointestinal microflora and the event of recuperation forms in the stomach related tract. This makes a difference to make strides the health status of other organs and frameworks. The down to earth application of probiotics clearly talks in favor of this claim. Probiotic microorganisms ought to be respected as an crucial fixing of food. Nonattendance, need or pulverization of portion or all of the valuable microflora postures serious risks to human health. Subsequently, one can not one or the other exist without the typical probiotic microorganisms nor can supplant them with something else. Dismissing this necessity is related with serious results for the health and life of people and animals. Very frequently probiotics are the as it were key to the treatment of a few infections of gastroenterological, useful and lack nature.

### Bacteria

Probiotic microscopic organisms, or more particularly bacterial strains with probiotic properties, are recognized by their particular

probiotic properties [2]. The last mentioned are the health impacts they apply on the human have. These health impacts have to be set up in double-blind, placebo-controlled clinical considers. It goes without saying that it is not practicable to distinguish set up probiotic microscopic organisms in food or defecation by their health impacts, since this would cruel that for each strain to be identified a clinical ponder would have to be carried out. The circumstance would alter, if the bacterial quality items (or quality item, if there is as it were one) dependable for the probiotic impacts, their states of action and their cellular concentrations essential to apply the probiotic impacts were known. At that point, recognizable proof of the bacterial species in conjunction with the accurately communicated dynamic quality items would be adequate for identification of a probiotic strain. Be that as it may, as long as a clear relationship between quality items of a particular bacterial strain on one hand and appearance of a health impact on the other hand has not been set up, surrogate tests are required. Such surrogate measures point at identifying probiotic microscopic organisms by strain-specific strategies. This is in line with the explanation made by FAO/WHO: "Strain typing has to be performed with a reproducible genetic method or using a unique phenotypic trait."

However, one has to bear in intellect that upon confinement of a modern possibly probiotic strain rectify task to a species or sub-species is fundamental. With this task, the hereditary foundation is defined the probiotic strain is implanted in. Hence, all data accessible on the species or sub-species, whether or not deterioration or pathogenic life forms are individuals of that species or sub-species, can be taken into account to judge upon the security of the confined microorganism.

### Gut Factor

Humans are complex organic 'superorganisms,' in which tremendous, different, and energetic microbial environments have coevolved performing imperative parts in the definition of the have (human) physiology [3]. In this human-microbe cross breed, the roughly 1014 intestine microorganisms, collectively named intestine microbiota, altogether contribute to the host's health status, impacting supplement bioavailability, glucose and lipid digestion system, sedate digestion system and poisonous quality, and resistant framework function.

Substantial interindividual inconstancy exists inside the human intestine microbiota and various have components apply particular weight on the microbiome, counting have genome, slim down, age, and inevitable pharmacological mediations. Additionally, dysregulated host-microbiota intelligent have been specifically involved in the etiopathogenesis of a number of infection conditions, such as obesity, cardiovascular disease, inflammatory bowel diseases, and autism.

The maturing prepare profoundly influences the structure and work of the human intestine microbiota and its homeostasis with the host's safe framework, coming about in more noteworthy helplessness to systemic contaminations, lack of healthy sustenance, side impacts of drugs, and conceivably contributing to the movement of constant diseases and frailty.

Probiotics, prebiotics, and their combinations may reduce common gastrointestinal disarranges in the elderly by tweaking microbial movement and resistant status. Comprehensive approaches based on the combination of diverse 'omic' sciences ((meta)genomics, microbiomics, transcriptomics, proteomics, metabolomics) are getting impressive intrigued, as they may shed newlight on the

corresponding impact between age-related changes in the intestine microbiota and the physiology of more seasoned people, as well as recognize conceivable targets for pharmaconutritional intercessions pointed at moving forward the wellness of more seasoned adults.

As for sarcopenia, a way better understanding of the advantageous relationship between the intestine microbiota and the aging living being is of most extreme significance to plan mediation procedures. In fact, the intestine microbiota may contribute to etiopathogenesis of sarcopenia, being included in the direction of incendiary and redox status, splanchnic extraction of supplements, fat mass testimony, and affront affectability. In expansion, the intestine microbiota may profoundly impact (or be impacted by) the bioavailability and bioactivity of most dietary components proposed as cures against sarcopenia. For occurrence, colonic microbiota seem balance the metabolic destiny of dietary polyphenols and other candidate CRM and EM, by changing over these compounds into bioactive substances.

Given the significance of the intestine microbiota in the direction of human physiology, more inquire about is justified to investigate the potential part of its control in the administration of sarcopenia.

### Antibiotics

Antibiotics are substances with antimicrobial activity, which impact both Gram-positive and Gram-negative microscopic organisms [1]. They restrain the development of or crush microbial cells. In arrange to fulfill these capacities, the antimicrobial substances must enter the cell, conjugate with a certain cell structure, which takes part in a crucial forms (DNA replication and cell division) or smother them completely.

The impact of 22 antibiotics -  $\beta$ -lactam (penicillin, ampicillin, cefamndole, ciprofloxacin, amoxicillin, oxacillin, piperacillin, azlocillin), aminoglycoside (streptomycin, gentamicin, kanamycin, lincomycin, clindamycin, amikacin, vancomycin, tobramycin), macrolide (rifampin, erythromycin), tetracycline (tetracycline, doxycycline), aromatic (chloramphenicol) and nalidixic acid, on the development of the chosen lactobacilli - is considered. The 22 antibiotics have a place to 3 groups with diverse instrument of activity – restraint of the amalgamation of the cell dividers (penicillin, ampicillin, cefamndole, amoxicillin, oxacillin, piperacillin, azlocillin, vancomycin), inhibition of the protein synthesis (streptomycin, gentamicin, kanamycin, lincomycin, clindamycin, amikacin, tobramycin, rifampin, erythromycin, tetracycline, doxycycline, chloramphenicol), inhibition of the synthesis of DNA and/or cell division (ciprofloxacin and nalidixic acid). The explored concentrations are identical to the actual concentration in in vivo antibiotic therapy.

All four strains of bifidobacteria (*Bif.bifidum* L1, *Bif.breve*, *Bif.infantis*, *Bif.longum*) are safe to the activity of most of the examined antibiotics with *Bif.bifidum* communicating the best comes about, taken after by *Bif.breve*, *Bif.infantis* and *Bif.longum*. They appear a few affectability towards the activity of aminoglycoside antibiotics. *Bif.bifidum* L1 illustrates thick development when tried against 18 out of the 22 antibiotics, frail development when inspected against 3 of the 22 antibiotics and it has single colonies in the clearance zone when tried against vancomycin. *Bif.breve* appears the taking after comes about: thick development - 9 out of 22 antibiotics, powerless development - 11 out of 22 antibiotics, no development - 2 out of 22 antibiotics. *Bif.infantis* exhibits thick growth when tried against 5 out of 22 antibiotics, frail development - 12 out of 22 antibiotics, single colonies in the

clearance zone - 3 out of 22 antibiotics, no development - 2 out of 22 antibiotics. *Bif.longum* is characterized with thick development when inspected against 15 out of 22 antibiotics, powerless development - 6 out of 22 antibiotics, no development - 1 out of 22 antibiotics. These comes about uncover the plausibility for the consideration of the strains in the complex treatment against diverse diseases.

The resistance of the cells of the distinctive *Lactobacillus* and *Bifidobacterium* strains to 22 of the most regularly connected in therapeutic treatment antibiotics uncovers the plausibility for their application in the cases of disbacteriosis. Besides, it is way better to utilize strains with characteristic polyvalent resistance as components of probiotics for the treatment of disbacteriosis.

### Foods

Lactic acid foods possess a major put in the count calories of our counterparts [1]. Approximately 80% of the population utilize yoghurt for coordinate utilization or as a food supplement every day. A characteristic include of this item is the expansion of starters of unadulterated societies of *Streptococcus thermophilus* and *Lactobacillus delbrueckii ssp.bulgaricus* for conducting lactic acid fermentation. By utilizing an fitting mechanical prepare a item with characteristic taste and smell, physicochemical and natural properties is gotten from drain as a crude fabric. These conventional lactic corrosive microbes have a positive impact on the body, which is a result of the shaped metabolites, which repress the putrefactive and pathogenic vegetation or of the change of the utilization of lactose.

Many utilitarian nourishments incorporate lactobacilli in their composition. Lactobacilli are especially imperative in the make of probiotic foods. A few species of the class *Lactobacillus* are utilized as starters in the fabricate of yoghurt, cheese and other aged fluid items. It ought to be famous that the properties of the strain itself are especially imperative in the choice of probiotic societies. Not all strains can be developed on an mechanical scale since of the low regenerative capacity in the medium or since of their low survival rate in the forms of solidifying and freeze-drying. That is why the societies utilized in the generation of fermented foods must meet certain requirements.

The determination of probiotic strains is based on microbiological criteria for food security of the last item. This is accomplished by applying non-pathogenic strains with clear health impacts and appropriate hygiene.

The high concentration of practical cells and the great survival when passing through the stomach permit lactobacilli and bifidobacteria in fermented milk items to fulfill their organic part in the intestine.

Several properties of microscopic organisms such as oxygen affectability, capacity soundness, resistance to the proteases of the stomach related framework, affectability to aldehyde or phenolic compounds delivered by the digestion system of amino acids, antioxidant movement, grip to the intestinal mucosa are inspected in in vitro testings. Strains display the particular properties of lactic corrosive microscopic organisms in a diverse degree. The combination of strains with diverse properties permits the increment in the natural movement of fermented foods. This in turn is related to their capacity to create as advantageous cultures.

### Diet

The center components of a sound dietary design are surprisingly steady over societies, tend to hold on over the life span (but with some of the time unwavering impedances from the impacts of Westernization), and connect emphatically to a wide assortment of health results [4]. Fundamental this consistency is the understanding that transcendently plantbased (e.g., Mediterranean, East Asian, South Asian) diets are antiinflammatory and are distant more beneficial than pro-inflammatory meat-based (e.g., Western) diets. In fact, an energy-dense, nutrient-sparse slim down actuates weight pick up, which leads to a tall provocative stack, autonomous of particular supplement impacts. To be beyond any doubt, the overpowering conclusionbased on thousands of years of perception and thorough and reproducible sciencedis that plant-based diets decrease hazard; and meat-based diets, particularly ones that incorporate numerous ultraprocessed foods, increment the chance of cancer.

Any count calories is complex and contains both useful and hurtful compounds, in spite of the fact that in broadly changing extents, which are regularly devoured in a dietary “pattern,” and are seldom devoured in confinement. This “pattern” of eating depends on both the people and the sociodemographic setting in which they live. Undoubtedly, distinctive designs of count calories and physical movement contribute to a metabolic and hormonal state that advances the securing of genetic and epigenetic modifications. These modifications can lead to cellular, basic, and utilitarian changes steady with carcinogenesis and affect the trademarks of cancerwith a specific center on inflammation.

### Health

While emphasizing the significance of strain specificity of mechanical qualities of probiotics, a few generalizations can still be made on the robustness of probiotic life forms [5]. By and large, lactobacilli are more strong than bifidobacteria. There is a more extensive extend of probiotic *Lactobacillus* species that are mechanically appropriate for nourishment applications than bifidobacteria. Common cases incorporate *L. acidophilus*, *L. johnsonii*, *L. rhamnosus*, *L. casei*, *L. paracasei*, *L. fermentum*, *L. reuterii* and *L. plantarum*. Regularly, the *L. acidophilus* group of living beings, whereas safe to low pH, demonstrate less robust than other lactobacillus species in non-traditional probiotic food applications. The *Bifidobacterium* species most commonly utilized in foods is *B. animalis* subsp. *lactis*. This species is altogether more strong than human intestinal species such as *B. longum* (infantis), *B. breve*, and *B. bifidum*, in spite of the fact that certain strains of these species are able to survive well in some foods. *B. adolescentis* is a common species in the intestinal tract of grown-up people, but tends to be delicate to natural conditions in nourishments and is once in a while utilized commercially as a probiotic.

The digestion system of the probiotic living being is an vital thought in fermented probiotic foods, not as it were for probiotic development and survival, but too for food quality. For illustration, heterofermentative lactobacilli that deliver CO<sub>2</sub> as a metabolic end item are not reasonable where gas arrangement unfavorably impacts on nourishment quality. Bifidobacteria create acetic acid derivation and lactate as conclusion items of carbohydrate fermentation, and a more vinegar-like taste profile if they are effectively maturing in food products.

The capacity to utilize the accessible carbon and nitrogen substrates in a item may be required for probiotic development and fermentation. Lactobacilli and bifidobacteria can by and large utilize

a wide run of carbon substrates, with contrasts in the carbon substrate profiles happening between species and strains. Probiotic strains may moreover be chosen on the premise that they metabolize alluring bioconversions, such as deconjugation of isoflavones in soy, or undoubtedly, since they do not metabolize other fixings in the nourishment. For some fermented foods where LAB frame portion of the local microbiota (e.g. fermented meats), an approach has been taken where the probiotic traits of societies confined from these foods (and subsequently known to survivewell) have been inspected to select modern probiotic strains.

### Conclusion

Everyday stress, aging, changes in the environment or dietary habits, viral infection, antibiotic therapy and radiation can lead to a disruption of the intestinal microbiota balance. Changes in the composition and amount of intestinal microbiota can cause changes in the intestines that create an ideal environment for the invasion of harmful, pathogenic microorganisms and the appearance of harmful substances they produce. Disturbed microbiota manifests itself in the intestines in the form of diarrhea, flatulence, and in women sometimes with symptoms of vaginal microbiota imbalance. We can act on all the mentioned problems by eating food enriched with probiotics and by taking probiotic preparations that can either preserve or restore the balance of the intestinal microbiota.

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