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Discover the Potential of Functional Foods

Functional foods are foods that have a potentially positive effect on health beyond nutrition. It promotes optimal health and helps to reduce the risk of diseases. Functional food covers a variety of foods like; minimally processed, whole foods along with fortified, enriched or enhanced foods can all be functional foods. In the main, these foods have a potentially beneficial effect on health when consumed on a regular basis and at certain levels. This article elaborates on the importance of functional foods, health benefits, types and various sources of functional foods.

INTRODUCTION

Good nutrition is the foundation of good health. All foods are considered to be functional to some extent thus it provides taste, aroma and nutritive value. However, foods are currently being examined intensively for added physiological benefits, which may reduce chronic disease beyond basic nutritional functions which is similar in appearance to conventional food and consumed as part of a regular diet. Functional foods are the food formulated by adding novel ingredients or enriching existing ingredients for health promotion and disease prevention. The term may also apply to traits purposively bred into existing edible plants, such as purple or gold potatoes are enriched with anthocyanin or carotenoid content respectively. The term "Functional foods" came into existence by 1980's in Japan where these goes into government approval process are named as 'Foods for Specific Health Use' (FOSHU). Functional foods become the main contributor for fastest emerging segments of the food industry. Functional foods are widely used as the dietary supplements in some countries. According to American Dietetic Association (ADA), the functional foods are the foods which include whole foods and fortified, enriched or enhanced foods had a potential health benefits when consumed as part of a diverse diet on a usual basis, at recommended levels. The ADA broadly classified the functional foods into four categories viz., conventional foods, modified foods, medical foods and foods for special dietary use.

CONVENTIONAL FOODS

Conventional foods are the most basic functional foods which remain in their natural state because they have not been modified by enrichment or fortification. Most of the whole fruits vegetables, nuts, seeds, legumes and whole grains are included under this category because they are rich in phytochemicals such as lycopene, lutein, vitamins, minerals and other beneficial compounds.

MODIFIED FOODS

Modified foods have been enriched, fortified or enhanced with nutrients or other beneficial ingredients. Calcium fortified orange juice, folic acid enriched breads and margarine enhanced with plant sterols are categorized under functional foods. Energy drinks that have been enhanced with herbs such as ginseng and guarana as well as other potentially controversial foods are also under this category.

MEDICAL FOODS

The FDA defines medical foods as “food which is formulated to be consumed or administered entirely under the supervision of a physician and which is intended for the specific dietary management of a disease or condition for which distinctive nutritional requirements based on recognised scientific principles are established by medical evaluation”.

FOODS FOR SPECIAL DIETARY USE

Foods for special dietary use are similar to medical foods but they are available commercially and don't require the supervision of a health care provider. The healing power of foods is a popular concept that focuses on how the “super foods” can have health protecting functions. A functional food offers great potential to improve human health and helps to prevent certain diseases when taken as part of a balanced diet and healthy lifestyle. A sharp increase in health issues among the consumers that there is need to promote fair trade and encourage product innovation in the food industry. The research opportunities in nutrition play a major role in exploring the relationship between a food and food component towards human health. There is a greatest challenge to scientists now and in the future for improved state of health and well-being with reduction of disease. Diet is only one aspect of a comprehensive lifestyle approach to good health, which should include regular exercise, tobacco

avoidance, stress reduction, maintenance of healthy body weight and other positive health practices. One of the effective strategies to address these health issues is consumption of functional foods to have healthy life with reduced disease risks. Functional food products typically include health claims on their label touting their benefits, for example millet is a significant source of fiber.

FUNCTIONAL FOODS IN THE ANIMAL ORIGIN

Probably the most intensively investigated class of physiologically active components derived from animal products are the (n-3) fatty acids, predominantly found in fatty fish such as salmon, tuna, mackerel, sardines and herring. The two primary (n-3) fatty acids are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). DHA is an essential component of the phospholipids of cellular membranes, especially in the brain and retina of the eye and are necessary for their proper functioning. DHA is particularly important for the development of these two organs in infants. EPA acts as a precursor for prostaglandin-3 (which inhibits platelet aggregation), thromboxane-3, and leukotriene-5 eicosanoids.

FUNCTIONAL FOODS IN THE PLANT ORIGIN

A functional food in the plant origin offers great potential to improve the human health and helps to prevent certain diseases when taken as part of a balanced diet and healthy lifestyle. Numerous plant foods or physiologically active ingredients derived from plants have been investigated for their role in



Figure 1: Benefits of Phytochemicals

Table 1: Types of Functional food and sources

Class/component	Sources	Benefits
Carotenoids		
Beta-carotene	Carrot, pumpkin, sweet potatoes, cantaloupe, spinach and tomatoes	Neutralizes free radicals which may damage cells, bolsters cellular antioxidants defenses; can be made into vitamin A in the body
Lutein, Zeaxanthin	Spinach, corn, eggs, citrus fruits, asparagus, carrots and broccoli	Supports maintenance of eye health
Lycopene	Tomatoes and processed tomato products, watermelon, red/pink grapefruits	Supports maintenance of prostate health
Dietary fiber		
Insoluble fiber	Wheat bran, corn bran and fruit skins	Supports maintenance of digestive health; may reduce the risk of some types of cancer
Beta glucan	Oat bran, oatmeal, oat flour, barley and rye	May reduce risk of coronary heart disease
Soluble fiber	Psyllium seed husk, peas, beans, apples and citrus fruits	May reduce risk of CHD and some types of cancer
Whole grains	Cereal grains, whole wheat bread, oatmeal and brown rice	May reduce risk of CHD and some types of cancers; supports maintenance of healthy blood glucose levels
Fatty acids		
Monounsaturated fatty acids (MUFAs)	Tree nuts, olive oil and canola oil	Reduce the risk of CHD
Polyunsaturated fatty acids (PUFAs)	Walnuts, flaxseeds and flaxseed oil	Supports maintenance of heart and eye health; supports maintenance of mental function
PUFAs – Omega-3 fatty acids-DHA/EPA	Salmon, tuna, marine and other fish oils	Reduce the risk of CHD; supports the maintenance of eye health and mental function
Conjugated linoleic acid (CLA)	Beef and lamb; some cheese	Supports maintenance of desirable body composition and immune health
Flavonoids		
Anthocyanins- Cyaniding, Pelargonidin, Delphinidin, Malvidin	Berries, cherries and red grapes	Bolster cellular antioxidant defenses; supports maintenance of healthy brain function
Flavanols- Catechins, Epicatechins, Epigallocatechin	Tea, cocoa, chocolate, apples and grapes	Supports maintenance of heart health
Procyanidins and Proanthocyanidins	Cranberries, cocoa, apples, strawberries, grapes, red wine, peanuts, cinnamon, tea and chocolate	Supports maintenance of urinary tract health and heart health
Flavanones- Hesperetin, Naringenin	Citrus fruits	Neutralizes free radicals which may damage cells; bolster cellular antioxidant defenses
Flavonols – Quercetin, Kaempferol, Isorhamnetin, Myricetin	Onions, apples, tea and broccoli	Neutralizes free radicals which may damage cells; bolster cellular antioxidant defenses
Isothiocyanates		
Sulforaphane	Cauliflower, broccoli, broccoli sprouts, cabbage, kale, horseradish	May reduce the risk of osteoporosis
Phenolic acid		
Caffeic acid, Ferulic acid	Apples, peas, citrus fruits, some vegetables, whole grains and coffee	Bolster cellular antioxidant defenses; supports maintenance of eye and heart health
Polyols		
Sugars alcohols – Xylitol,	Some chewing gums and other	May reduce risk of dental caries

Sorbitol, Mannitol and Lactitol	food application	
Prebiotics		
Inulin, Fructo-oligosaccharides (FOS), Polydextrose	Whole grains, onion, some fruits, garlic, honey, leeks, banana, fortified foods and beverages	Supports maintenance of digestive health; supports calcium absorption
Probiotics		
Yeast, <i>Lactobaccilli</i> , <i>Bifidobacteria</i> and other specific strains of beneficial bacteria	Certain yogurts and other cultures dairy and non-dairy applications	Supports maintenance of digestive and immune health; benefits are strain specific

disease prevention and health. Garlic (*Allium sativum*) has been used since thousands of years for the medicinal purposes; its effects are likely attributable to the presence of numerous physiologically active organosulfur components (e.g., allicin, allylic sulfides). Garlic has been shown to have a modest blood pressure lowering effect in clinical studies. The epidemiological studies showed that an inverse relationship between garlic consumption and certain types of cancer, for the most part of the stomach. And also, garlic show evidence of from the documented clinical effect it has the ability of reducing blood cholesterol. Cranberries are the biologically active component and prevent the *E.coli* from adhering to the epithelial cells lining in the urinary tract. And an anti-adhesion property of the cranberry may also provide other health benefits, including in the oral cavity.

From the epidemiological investigation tomatoes and tomato products possess cancer chemoprevention effect and it has significant dietary sources of lycopene, a non provitamin A carotenoid is also potent antioxidant. Biotechnologically derived crops have tremendous potential to provide iron enriched

rice. These grains offer high levels of iron and β -carotene helps to prevent iron deficiency anemia and vitamin A deficiency.

CONCLUSION

Functional food let consumers eat augmented foods secure to their natural state, rather than consuming dietary supplements manufactured liquid or capsule form. These are food products that contain vital nutrients that transcend simply nurturing usual growth and development of a personal. Fortified with nutritional and disease preventing qualities, consumption of such food is with an intention towards improved wellbeing, prolonged existence and prevention of chronic diseases. Functional foods proffer possible way to improve health and forestall the assorted chronic diseases by the way of taken as balanced or modified diet. In future, foods enhanced with nutritive or other non-nutritive substances help to prevent chronic diseases like as heart diseases, cancer and osteoporosis etc.,. The communication of health benefits of functional foods to the consumers is additionally a critical importance. So they need to know the knowledge to create choice about the functional foods they eat and revel in a healthy life.