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FUNCTIONAL FOOD IN JAPAN: MODERN ERA TOOL FOR HEALTHY LIFE

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ABSTRACT

Functional food is the new practical and effective approach to maintain healthy life style. Functional food helps to get rid off life style related disease such as diabetes, hypertension, and various cardiovascular diseases. The Japan which is Asian country, considered as pioneer in the functional food developments. In this article we have thoroughly described and stated the functional food perspective of japan to obtain healthy and prosporus life. The FOSHU foods which are stated by Japanese governments has been playing crucial role in the functional food market in the Japan. Yogurt and Liquorice are considered as backbone of functional food in Japan. Functional food provides nutrients like vitamins, mineral, and antioxidants to the body. These properties of functional food helps to prevent almost completely, diseses and disorders like cancers of various types, diabetes and the obesity including various cardiovascular systems disorders. Japan come put forth as good example for effectively implementing functional food policy throughout the country.

KEYWORDS: Functional Foods, Vitamins, Japan, Foshu, Cancers.

INTRODUCTION

Functional food is considered as practical and new way of maintaining Health and promoting Healthy lifestyle. Functional foods can be found in all the food categories. It brings out state of will bring and reduces the risk of diseases.[1]

Functional force acts as one of the most promising fascinating element of Food Industry. Various ingredients are being added to make food more functional. Phenolic compounds mainly causing antioxidant activity are crucial part of functional foods. High antioxidant properties make them more useful.[2] Health benefits and also obtained through a proper diet fruits vegetables grains and legumes and also seeds. Number of foods having functional properties in the health have been grown largely and playing crucial role in the food industry as well as medical fields. Cancer diabetes heart disease and hypertension are examples of diseases which can be cured or prevented by using functional foods.[3]

One of the main component of functional food is probiotic and prebiotics. Probiotics are foods for probiotics. Probiotics are like asparagus, garlic, and banana, where prebiotics are yogurt, sour cream and also probiotic milk s. Prebiotics and probiotics are outstanding components of functional foods.[4] Recently functional food has shown promising activities in the prevention and the duration of several chronic diseases such as a metabolic syndrome. It plays major role in metabolic abnormalities which includes obesity dyslipidemia insulin resistance increase in oxidative stress and the increase pro- inflammatory rate and hypertension.[5]

Buckwheat being a dicot pseudo cerals has an potential in the functional food field. It contains phenolic compounds phytosterols, fagopyrins and dietary fibres. It also contains several minerals antioxidants and saturated fatty acids vitamins. Several application of buckwheat are there to prevent various types of diseases ors disorders related to the lifestyle related habits.[6] Aspects regarding functional foods want to be helpful in playing a central role in helping consumers to select among various of the food alternatives.[7] Food industries are now focusing on investment in the research regarding functional foods and developing various new technologies to make functional food more useful.[8]

All health benefits which are related to the functional foods are due to the phytochemicals present in fruits vegetables The Herbs and spices.[9] The term functional and nutraceuticals are termed alternatively including their various uses in the daily diet. The function which are performed by the functional food includes antioxidant property antimicrobial and immunomodulatory is also hypocholesterolemic properties.[10]

Dietary proteins are more promising ingredient concept. The protein contributes to the phytochemicals as well as essential properties of various protein rich functional foods. Protein is also add that build up molecule in the development of healthy body.[11]

Functional food perspective and policy in Japan

Japan has been working in collaboration with analyst and other persons like scientist to find practical applications of functional food sciences. Foods for the specified health use which is nothing but FOSHU foods products have been appeared in market in Japan. This includes the example of hypo allergic rice. Such various trends leads to the motivation along the scientists and the technologist to design and produce the foods with improved and beneficial functionalities.[12]

In Japan, they have initiated the national project regarding functional foods in 1998. In 1991, there came outcome of this project with launch of national food for specified health use policy; 703 different foods for specified health use products along with 11 categories of health claims have been approved upto the present (31 August 2007) till the date of the studies.

The term Nutrigenomics were coined which broadly comprise transcriptomics as its major components. Initiative taken place to search over the milk basic proteins, milk lactoferrins hydrolysate was investigated for its soecial functionalities. Wheat proteins hydrostats were have been practically useful as hypoallergic food products. Also some basic studies have been conducted on the anticarcinogenic auraptenes.[13]

The Japanese council for Regulatory perform (CAA) regulated foods for special dietary uses. They have set limits and also some standards for the macro and micro nutrients to be present in the functional foods.[14]

They have notified one table regarding foods with functional claims.

Table no: 01 Health claims and their functional ingredients.

Health claims	Funtional Ingredients
Helps to reduce visceral fat and high BMI	Lactoferirin, chitoglucan, isoflavin from glabridin, acetate, *Lactobacillus gaseri* sp; EGCG, procyanidin, CP1563, BB536, procyanidin
Slows elevation of postprandial levels by inhibiting dietery fat absorption	Indigestible dextrin, B-glucan, Wheat albumin, salacinol, 5-aminolevulinic acid, mulberry leaf, procyanidin B1
Decreases serum triglyceride and LDL cholesterol levels	Monoglycosyl hesperidin, EPA/DHA, Indigestible dextrin, peocyanidin B1, lycopene, polydextrose, chitosan, Terminalia bellirica polyphenol,

	alpha –linoleic acid, gallate type catechin, indigestible dextrin
Helps to maintain normal blood pressure in individuals with hypertension	Lactotripeptide , valyl-leucine, gyma-glutamyl-S-allylcysteine , cacao flavanol, alpha-linoleic, GABA, wakame seawood peptide, acetate, peperine, lycopene
Improves bowel movements by increasing intestinal flora	*Bifidobacterium longum*, *Bifidobacterium bifidum (*BifiX), indigestible dextrin, genkwanin glycoside, gasseri sp, Bacillus coagulans lilac-01, psyllium dietery fiber
Helps to moisturize skin	Sodium hyaluronate, rice glucosamine, astaxanthin, proteoglycan
Supports eye function	Lutien, astaxanthin, cyanidin -3-glucoside, bilberry anthocyanin, crocetin
Decreases syress and promotes healthy sleep	Theanine, glycine, L-serine, sake yeast GSP6, crocetin, GABA, cyclo-(Leu-pro), cyclo-(PhePro), cyclo-(Tyr-Pro), ornithine, isoquercitrin
Supresses oxidation of blood lipids; skin moisturization	Astaxanthin
Joint function	Collagen peptide, glcosamidne hydrochloride, unmodified type II collagen, S- adenosylmethionine, proteoglycan, sodium hyaluronate
Reduce fatigue and stress	Theanine, GABA, Imidazole peptide, reduce form coenzyme Q10, litchi polyphenol, sesamin, histidine, BCAA, citrate, lactoferrin
Alleviates ocular and nasal irritation	O-methylated catechin, *Bidenspilosa* caffeic acid
Maintains bone health by facilitating bone metabolism	B-cryptoxanhin, isoflavone
Improves memory	Gingko leaf flavanoids glycoside, ginko leaf terpne lactone, DHA, EPA
Maintains peripheral temperature	Monoglycosyhesperidin , 6- gingerol
Maintains healthy liver function	Curcumin
Helps to maintain muscle tone during ageing	Leucine, 3-hydroxy-3-methylbutyrate
Helps to maintain walking ability in elderly	Black ginger 5,7-dimethoxyflavone

FOSHU increased the total to 223 items of which more than 50% incorporates the oligosaccharides as the functional the components. Oligosaccharides seem to be more promising components in the Japan in case of functional foods. The main role will be reduction in the lifestyle related disease such as diabetes and the hypertension in the near future and also it will improve the human health.[15]

Table no: 02: Categories of FoSHU and functional ingredients used.

Health claim category (function)	**Example of functional ingredients**
Promotes gut health	Dietary fiber, oligosaccharide, bacteria.
Promotes tooth and gum health	Sugar alcohol, tea polyphenol, milk protein digests, funoran isoflavone, calcium, macrocarpal
Enhances mineral absorption	Casein phosphopeptide, oligosaccharide, poly y-glutamic acid
Promotes bone health and strength	Milk basic protein, isoflavone, vitamin K2
Alleviates skin drying	Glucosylceramide
Lowers blood pressure	Food protein-derived peptide, y-aminobutyrate, acetic acid, chlorogenic acid, glucosyl hesperidin, quercetin glycoside
Reduces blood glucose levels	Indigestible dextrin, indigestible recrystalized amylose,

	wheat albumin, tea polyphenol, arabinose, thiocyclitol
Reduces blood cholesterol levels	Soybean protein, chitosan, low molecular weight alginate, phytosterol, tea catechin, S-methylcysteine sulfoxide
Reduces blood neutral lipid levels and body fat	Tea polyphenol conjugate, globin digest, indigestible dextrin, catechin, conglycinin, n-3PUFA, glucosylhesperidine

FoSHU, Food for specified health use; n-3PUFA, n-3 polyunsaturated fatty acid.[16]

Several years ago, the Japanese government has changed the name of the elderly people's disease to lifestyle related disease, for diseases such as including diabetes, cardiovascular disease, hypertension and the cancer. In this disease functional foods plays major role. To provide the information on foods to the people, the ministry of Health and welfare established a regulatory system for foods and with their health claims. There are two categories for the food with health claims i.e. the functional food.

i. FoSHU (Foods for specified health use).
ii. FNFC (Foods with Nutrient function claims).

FNFC includes twelve number of vitamins i.e. vitamin A, B, B2, B6, B12, C, E, D, Biotin, pantothenic acid, folic acid, and niacin.[17]

Perspective of Japan

1) There was sudden increase in the function food demand after the FOSHU came into the existence.
2) The curve declined after 2007, gradually due to many of the reasons.
3) There was difficulty in maintaining the balance between research costs and profits.
4) Additionally they have came to the conclusion that if more will be scientific reviews based on previous historical knowledge it will reduce the cost of clinical studies trials.[18]

Yogurt as functional food in Japan

They consider yogurt as good alternatives to the cereals providing natural auras and the goodness to the gut health. Many people in Japan consumes yogurt on daily basis. The condition health claim of yogurt is maintaining gastrointestinal condition.

Yogurt is also useful in the constipation relief. It is found to be useful in skin care. Plain and frozen yogurts are mainly used as an "ingredient for skin conditioning". It alleviate the effects of tobacco and prevents colds.[19]

Liquorice

Liquorice (Glycyrrhizaglabra, G.inflata, Glycyrrhizauralensis) is a perennial of the legume family which is distributed from east asia to Europe. It is used as functional food in both the pharmaceutical and the health foods sectors. I n the Japanese pharmacopoeia, products containing not less than 2% of glycerrhizin as dried matter from the roots and stolons of G.uralensis and G.glabra are used as crude drugs. Main application of health foods containing liquorice is its estrogenic activities, antioxidant activities and a functional activities various foods have found to containing small amount of glycyrrhizin. They have shown estrogenic activities which may be useful in the medical use for the maintaining bone health in the post-menopausal women's. It should be taken with precautions in case of younger women's.[20]

Overview of functional food

The term functional food basically introduced and accepted 10 years ago in the Japan which is now internationally accepted. Functional food gained value in Japan as well as on international levels. It is Japan's opinion that their concepts of the functional food will go beyond their traditional role in heaths promotions. To carry out each outstanding progress the Japan studied tertiary function and the functional foods themselves. The research have been conducted in the research institute and the ministry of the agriculture, forestry, and fisheries as well as universities. Many countries including the Japan are going to face advantage in the functional food science and the practices, with main aim of the subject will be disease prevention with the aids of the new entity called as functional foods.[21]

Functional food has shown promising effects in the large population or we can say that broad spectrum of customers. This attracted "R & D" in the field of functional food in Japan. Now the point is to promote Japanese functional food to the overseas markets. For that the government has to do some essential steps. Peoples in Japan now completely aware of the health benefits of the functional foods and they are now emphasizing functional foods in day today life.[22]

Japan is considered as pioneer leader in the development of functional foods. Japanese people take functional food very seriously. As per the regulatory systems considered in Japan, it is considered to be originated with Health food and Nutritional food association (JHfNFA) and the research board of Technology for the futures foods were established. This was established in 1998. Most important concern of Japanese government is about the aging of Japanese peoples. The functional food found to be very effective in that aspect.[23]

Applications of functional food

i. Cardiovascular disease

It includes hearts disease and stroke. Now a days it is major cause of death in western countries. Recent studies have shown that Reactive oxygen species i.e. ROS and LDL oxidation leads to the pathogenesis cause of atherosclerosis and the cardiovascular heart diseases through the plaque formation initiation.

Diet containing healthy cholesterol like fish oils and fish products also food rich in magnesium, calcium, phosphorus and other ingredients leads to healthy heart.

ii. Obesity

This is characterized by the accumulation of excess fat in methods functional foods plays crucial role in the reducing body fats levels. Maintaining the proper functional food balance species ie. ROS. which is cause for most of the cancer like breast cancer, lymph node cancer and leukemia's i.e. the blood cancer . Use of bioactive compounds present is funtional food need to be studied thoroughly and this will ultimately helpful in the prevention of various types may leads to the proper weight of the person.

iii. Cancer

Cancer development is a long term process which would take several days to show proper symptoms. Several epidemiological studies have shown that dietary material can alter the carcinogenesis. some of functional foods which contains phenolic compounds use to reduce concentration of reactive oxygen of cancer.[24]

CONCLUSION

It is found that functional food perspective and policies in Japan revolves around the FOSHU i.e. Foods for specific health use. HSO the foods with Health Claims (FHC). Currently till date there are over 700 products in Japanese food market may carry FOSHU status.

They are commonly stated to provide health benefits such as cholesterol lowering blood pressure regulating and also gastro-intestinal health which ultimately help in immunity development. The scientific reviews based on the literature survey which includes thorough overview of various historical documents regarding functional foods may reduce the cost required for additional clinical trials. More studies need to be done in order to give more power to the functional food industries.

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