

Lycopene as a potential natural antioxidant in yoghurt

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Milk and different dairy products are essential for human health due to their higher content of protein, vitamin and minerals particularly calcium, potassium, magnesium and phosphorous.

These dairy products can be made more nutritious by the addition of various complementary ingredients like multivitamins, minerals, fruit pulp, chocolate, and flavor and by adding spices like cinnamon, ginger, clove and different fruits and vegetable extracts. New-born babies adapt themselves with the help of various bioactive and nutrient components of milk that stimulate and mature the digestive system and cellular growth that is most desirable for postnatal adaptation.



Fermented milk is widely produced in many countries. Fermentation serves to preserve the foods by the conversion of ingredients into digestible forms and enhances the nutritional and sensory properties of the food product. It is the conversion of carbohydrates to carbon dioxide, organic acids and alcohols by the use of yeast or bacteria under anaerobic conditions.

Fermented foods offer a wide range of texture, flavor and aroma to improve the value of human diet. More than 3,500 fermented foods are distributed throughout the world.

The new varieties of fermented milk products are regularly entering the consumer market. Yoghurt is probably the most popular product among all fermented milk products (like sour cream, buttermilk, ropy milk, acidophilus milk and cheese) because it has a pleasant aromatic flavour and thick creamy consistency.

Yoghurt improves lactose digestion, nutritive value, antimicrobial, anticarcinogenic properties and reduce cholesterol level. In addition it is an outstanding source of calcium, phosphorus, potassium and water-soluble vitamins, particularly thiamin and riboflavin. Yoghurt is a popular milk product with significant health beneficial effects and higher nutritional value.

Yoghurt is an important food ingredient in most of societies. It is believed that consumption of yoghurt and other dairy products is very beneficial for health. The nutrient value of curd or yoghurt depends on the milk composition and substances added to it during manufacturing. Yoghurt can be manufactured from skimmed or whole milk and it can be sweetened, plain or flavoured with fruit juices, cane sugar etc. The production and consumption of yoghurt have increased all over the world due to its therapeutic properties. Many health benefits are due to live bacteria present in yoghurt. It is a healthy food because it has high levels of protein and calcium.



It has been proved in several studies that the health-promoting effects of fruit and vegetables are due to the existence of phytonutrients e.g. tocopherols, carotenoids and anthocyanins. Phytonutrients are plant-derived materials performing a key role in maintaining

human health, especially in disease prevention. In the recent era, phytochemicals-based nutraceuticals, especially from fruits and vegetables, are becoming popular due to consumer awareness regarding their health-enhancing potential. Epidemiology studies have correlated the consumption of these constituents with decline the incidence of several physiological threats.

The bioactive ingredients are diverse in nature like phenolics and carotenoids showing considerable anti oxidative activity. Among various dietary intervention to cope with life-threatening ailments, carotenoids like lycopene, β -carotene and lutein are the promising components. Such constituents are effective against an array of non-communicable disorders like dyslipidemia, diabetes mellitus and oxidative stress thus exerting hypocholestrolemic, hypoglycemic and some other beneficial effects. Consumption of a diet rich in phenolics increases the antioxidant concentration in blood and body tissue thereby protects against oxidative stress.



Various vegetables and fruits have innate therapeutic worth due to the existence of bioactive ingredients like nutrient, fibers, pectin, polyunsaturated body fat, anti-oxidants, phytoncides (natural antibiotics) and natural vitamins. There are established facts that vegetables are concentrated resource of natural elements that alone or in mixture beneficent for individual wellness. Among them, tomato is gaining attention of the scientists due to the existence of potent anti-oxidant i.e. lycopene. Consequently, vegetables and fruits derived nutraceutical are important significance to curtail various physical threats via distinct pathways.

The advent of the 21st century has seen the changing trends of consumers towards natural products owing to the growing knowledge about health ailment arising due to synthetic

additives. In food systems, different types of additives are in use, i.e. coloring agents, flavoring agents and variety of preservatives. Among these additives, antioxidants are important due to their role in free radical scavenging to stop the process of oxidation. These are the substances that prevent reaction of various food constituents with oxygen thereby, avoiding deterioration caused by simple oxidative chemical reactions.



A number of synthetic antioxidants have been used to prevent this problem which includes butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA) and tertiary butyl hydroquinone (TBHQ) etc. However, due to increasing information on possible adverse health effects of some synthetic food antioxidants as well as general tendencies in consumer preferences towards natural products, there is a growing interest in utilization of natural antioxidants to safeguard the food from deteriorative effects of oxidation.

Lycopene is an essential nutrient as it is not synthesized internally, and must therefore be provided from food source which contain lycopene. Lycopene is a carotenoid abundantly found in tomatoes as well as tomato-derived products, and it gives color to tomato. Different proceeding explored the various properties of carotenoids such as physicochemical and biological characteristics that make it natural antioxidants and coloring compounds, because it contain eighty to ninety percent of the total pigment content. In another trial, lycopene dosage @ 75mg/day did not signify any adverse effect on human health. Likewise, no adverse effect on liver and kidney functioning was observed due to lycopene consumption. Lycopene

from tomato peel and seeds can be use as a functional compound to improve the nutritional and therapeutical value of dairy products specially yoghurt.



Lycopene is a main pigment compound of the tomato with strong natural antioxidant especially against reactive species (O_2 singlet) that promotes the cell injury as well senescence. The main source of lycopene in the human diet are tomato and tomato-based food products. Oxidative stress provides base from different chronic diseases. According to dietary plan, increased intake of fruits and vegetables can lower the risk of numerous human diseases like cancer, osteoporosis, diabetes and cardiovascular diseases. Fruits and vegetables represents a great source of phytochemicals that lower the negative effects of oxidative stress. Carotenoids are also a phytochemicals group that provide colors to different foods. They have a significant role in obstruction of human diseases and maintaining good health and they also have a contribution in vitamin A. It has been proved through some scientific evidence that phytochemicals play a beneficial role in prevention of different chronic diseases. The chemistry of carotenoids were studied widely but their bio-availability, metabolism and biological functions are only at beginning to be examined. Lately carotenoids acquired much more curiosity because of the part associated with lycopene within human being wellness.

