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Nutritional Value and Health Benefits of Different Vegetables

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Vegetables contribute a major source of nutraceuticals for well-balanced human diet. The nutraceuticals are the substances found as a natural component of foods or other ingestible forms that have been determined to be beneficial to the human body in preventing or treating one or more diseases or in improving physiological performance beyond adequate nutritional affects in a way that is relevant to either improved stage of health and well-being and reduction of risk of disease. These components can be beneficial antioxidants, natural colorants (e.g. carotenoids), minerals, vitamins, which often have added advantages. While the nutritional importance of vegetables has long been recognized within the nutrition and medical communities, there is an increasing awareness among the general public of the health advantages of diets high in vegetables. Vegetables are grown worldwide in almost 200 countries and make up a major portion of the diet of humans in many parts of the world. Wide range of climate and physio-geographical conditions around world ensures availability of most kind of vegetables. Total vegetable production in the world has been estimated to be 486 metric tons, respectively. India is the second largest producer of the vegetables (176.177 Million tonnes) in the world. Because they include carbohydrates, many vegetable commodities satisfy human caloric needs, and legume crops are particularly excellent sources of vital amino acids. Leafy and Vitamins, minerals, and dietary fiber can also be found in other plants. The nutritional value of diets can be further enhanced by the inclusion of vegetables. Better education on their nutritional value and dietary modifications that will help people, particularly those on marginal diets, can help achieve this. Certain phytochemicals found in vegetables are potent antioxidants that are believed to lower the risk of developing chronic illnesses by preventing damage from free radicals, altering the metabolism and detoxification of carcinogens, or even influencing processes that change the trajectory of tumor cells. A regular diet rich in vegetables has been closely linked to improved stomach and visual health, decreased risk for some types of cancer, heart disease, stroke, diabetes, anemia, gastric ulcers, rheumatoid arthritis, and other chronic illnesses. Unfortunately, high-calorie grain crops frequently take precedence over vegetable cultivation in poorer nations. Growing awareness of the health benefits of vegetable-rich diets and the availability of a wider range of vegetables has encouraged increased vegetable consumption in many parts of the world. According to a global assessment, at least 402 vegetables are grown and sold globally. They stand for 230 genera and 69 families. Leafy vegetables made up 53% of the total from this enormous diversity, followed by fruits (15%) and roots and tubers (17%). Only a small percentage of the veggies are processed; the majority are perishable and sold fresh. Vegetable quality is at its best when consumed soon after harvest.

Crucifers Vegetables : Cruciferous vegetables (Brassicaceae or Cruciferae family) which include, cabbage, brocolli, cauliflower, Brussels sprouts, kales, kailan, chinese cabbage, turnip, rutabaga, radish, horseradish, rocket, watercress, mustards, among other vegetables, provide the richest sources of glucose- nolates in the human diet. Most consumers associate cru-ciferous vegetable consumption with health. They have reasons for that because based on one of the largest and most detailed reviews of diet and cancer, the World Cancer Research Fund in USA concluded that a diet rich in crucifers is likely to protect humans against colon, rectum, and thyroid cancers, and when consumed with vegetables rich in other phytonutriceuticals, can protect against cancer in other organs. Crucifers also contain significant amounts of dietary fiber. Dietary fiber content of cauliflower was estimated to be about 5% of the total fresh weight or about 50% of the total dry weight, consisting of about 40% non-starch polysaccharides. Cellulose and lignin concentrations in Brussels sprouts were estimated to be 36% and 14.5%, while in cauliflower they were estimated to be about 16% and 13% of the total dry matter, respectively (Fermenia *et al*., 1999).

Alliums : Alliums vegetables (Alliaceae family) include, garlic, onion, leek, chive, Welsh onion, among other vegetables. They are rich in a wide variety of thiosulfides, which have been linked to reducing various chronic diseases. Similar to glucosinolates in crucifers, the types and amounts of thiosulfides in alliums vary significantly. Typically, they contain 1% to 5% non-protein sulfur com- pounds, on a dry weight basis. In onion leaves, about 55% of the total flavonoids is quercetin, 31% kaempferol, and 14% luteolin. In onion bulb, more than 95% of the flavonoids is quercetin and only a trace amount of kaempferol. High fructan diets have also been shown to lower concentration of colesterol, tryacylglycerol, phospholipids, glucose and insulin in the blood of middle-aged men and women. In herbal Medicine, garlic has been traditionally used for asthma, deafness leprosy, bronchial congestion, arteriosclerosis i.e. hardening of arteries, fevers, worms and liver gall bladder trouble. Garlic is good for the heart, a food for the hair and a stimulant to appetite. In recent times, experiments have confirmed several ancient beliefs about the healing value of this herb. These experiments have in fact proven much greater power of garlic than known previously. The unpleasant odour in garlic is due to its Sulphur content. balance of sweetness in an onion is determined by the pungency and sugar levels. Strong pungentness will disguise a high sugar level to avoid the onion being considered sweet. Low pungent and low-sugar onions may also be considered as bland. Ideally, high sugars and low pungence will be a sweet onion.

Cucurbitaceous Vegetables : The Cucurbitaceae family, commonly known as cucurbits, encompasses over 900 species distributed across tropical and subtropical regions. This plant family includes widely consumed vegetables and fruits such as pumpkins (*Cucurbita* spp.), gourds (*Lagenaria* spp.), melons (*Citrullus* spp.), and cucumbers (*Cucumis* spp.) (Smith *et al*., 2020). These plants have played an integral role in human diet and medicine for centuries, providing essential nutrients and bioactive compounds with significant therapeutic properties (Jiang *et al*., 2020). Traditional medicinal systems, including ayurveda, traditional Chinese medicine (TCM) and african folk medicine, have long utilized cucurbits for their curative properties in treating ailments such as fevers, infections, inflammation, and digestive disorders. Cucurbits are a valuable source of bioactive compounds with immense pharmacological potential. Their antioxidant, anti-inflammatory, antimicrobial, anticancer, and cardioprotective properties make them an integral part of both traditional and modern medicine.

Solanaceous Vegetables : The use of solanaceous vegetables in traditional medicine is ancient. This group includes different vegetables such as Brinjal, Tomato, Potato, Chiili and Hot peppers. Fresh tomatoes and a variety of processed ones, such as ketchup, whole or chopped tomatoes in cans, purees, sauces, soups, juices, and sun-dried tomatoes, are popular. Apart from their culinary function in the diet, tomatoes are a low-energy-dense food with special ingredients that could have health benefits. Carotenoids, which include 60% to 64% lycopene, 10% to 12% phytoene, 7% to 9% neurosporene, and 10% to 15% carotenes, are the

main phytochemicals found in tomatoes. The richest sources of lycopene in the world are tomatoes and dishes made from them. Humans typically consume 25 mg of lycopene per day, with fresh and processed tomato products accounting for over 85% of this daily intake. In general, potato is perceived only as a source of carbohydrates, but is also an excellent source of essential amino acids. The predominant form of this carbohydrate is starch. A small but significant portion of this starch is resistant to digestion by enzymes in the stomach and small intestine, and so reaches the large intestine essentially intact. In addition to high quality proteins, potato tubers ac- cumulate significant amounts of vitamins and minerals, as well as an assortment of phytochemicals including phenolics, phytoalexins, and protease inhibitors. Chloro- genic acid constitutes up to 90% of the potato tuber natural phenols. Peppers come in a beautiful array of colors and shapes. They add flavor, color, and crunch to many low-calorie dishes. All fresh peppers are excellent sources of vita- mins C, K, carotenoids, and flavonoids.

Conclusion

Consuming a diet high in vegetables on a regular basis offers undeniable health benefits because the phytonutriceuticals in vegetables can shield the body from a number of chronic illnesses. Vegetables reduce illness risk through a complicated and largely unexplained mechanism. The overall health benefit is probably influenced by a number of the food's components.

Numerous phytonutriceuticals with antioxidant qualities can either directly reduce free radicals or indirectly by taking part in redox-balance-sensitive cell signaling pathways.

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