



Vegetables' Nutritional Value and Health Advantages

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The vegetables include a large amount of the human diet and are important for human nutrition, particularly as sources of phytonutrients, which include minerals, dietary fiber, Vitamins C, A, B₁, B₆, B₉, E, and phytochemicals. Strong antioxidants found in some vegetable phytochemicals may lower the risk of chronic disease by preventing damage from free radicals, altering the metabolic activation and detoxification of carcinogens, or even influencing processes that change the trajectory of tumor cells. Consuming vegetables on a daily basis has been closely linked to improved gastrointestinal health and vision, lower risk of heart disease, stroke, diabetes, anemia, stomach ulcers, rheumatoid arthritis, and some types of cancer, as well as other chronic illnesses (Dias J. S. 2012). All the vegetables may offer protection to humans against chronic diseases. Nutrition is both a quantity and a quality issue, and vegetables in all their many forms ensure an adequate intake of most vitamins and nutrients, dietary fibers, and phytochemicals which can bring a much-needed measure of balance back to diets contributing to solve many of these nutrition problems.

The health benefits of the most consumed vegetables

Crucifers: Cruciferous vegetables (Brassicaceae or Cruciferae family) which include, cabbage, broccoli, cauliflower, Brussels sprouts, kales, chinese cabbage, turnip, rutabaga, radish, mustards, among other vegetables, provide the richest sources of glucosinolates in the human diet. Most consumers associate cruciferous vegetable consumption with health. Crucifers rich in glucosinolates. Analysis indicated that 79% of β -carotene, 82% of α -tocopherol, and 55% of vitamin C variability in broccoli were associated with genetic factors (A. Kurilich 1999). Crucifers are also excellent source of folate. Brussels sprouts and broccoli were ranked among the highest vegetable sources for folate, contributing about 110 to 135 and 70 to 90 $\mu\text{g}/100\text{ g}$, respectively (J. Scott *et al.*, 2000). 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, 1997). 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% nonstarch polysaccharides.

Alliaceae: Alliaceae family vegetables 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. Onion and garlic are an excellent source of calcium, potassium and manganese providing up to 10% of the human daily requirements of these elements. High fructan diets have also been shown to lower concentration of cholesterol, triacylglycerol, phospholipids, glucose and insulin in the blood of middle-aged men and women (K. G. Jackson 1999). A reduced cancer risk has been widely documented also for colorectal and prostate cancers.

Solanaceous Vegetables: The use of solanaceous vegetables in traditional medicine is ancient. Tomato is popular fresh and in many processed forms (e.g. ketchup, canned whole or

in pieces, puree, sauce, soup, juice, or sundried). Compositionally, the tomato has a unique nutritional and phytochemical profile. The major phytochemicals in tomato are the carotenoids consisting of 60% to 64% lycopene, 10% to 12% phytoene, 7% to 9% neurosporene, and 10% to 15% carotenes (**S. Clinton 1998**). The increased recommendation was based on evidence indicating that 4700 mg potassium should help lower blood pressure, reduce the adverse effect of excess sodium intake on blood pressure, reduce the risk of kidney stones, and possibly reduce age-related bone loss. Tomato fruits are also an excellent source of ascorbic acid, about 200 mg/kg and are the major source of vitamin C next to citrus (**A. V. Rao and L. G. Rao, 2007**). For skin protection, tomato intake (40 g tomato paste corresponding to a lycopene dose of approximately 16 mg) for more than 8 weeks reduced ultraviolet light-induced erythema.

All fresh peppers are excellent sources of vitamins C, K, carotenoids, and flavonoids (**L. R. Howard *et al.*, 2000**). Antioxidant vitamins A and C help to prevent cell damage, cancer, and diseases related to aging, and they support immune function. They also reduce inflammation like that found in arthritis and asthma. Vitamin K promotes proper blood clotting, strengthens bones, and helps protect cells from oxidative damage. The capsaicin in hot peppers has been shown to decrease blood cholesterol and triglycerides, boost immunity, and reduce the risk of stomach ulcers. It used to be thought that hot peppers aggravated ulcers. Instead, they may help kill bacteria in the stomach that can lead to ulcers. Capsaicin has also analgesic, anti-bacterial, and antidiabetic properties.

The eggplant also contains important phytochemicals which have antioxidant activity. Phytochemicals contained in eggplant include phenolic compounds, such as caffeic and chlorogenic acid, and flavonoids, such as nasunin. Nasunin or delphinidin-3-(coumaroylrutinoside)-5-glucoside is the major phytochemical in eggplant. Eggplant is an excellent source of digestion-supportive dietary fiber and bone-building manganese. It is very good source of enzyme-catalyzing molybdenum and heart-healthy potassium. Eggplant is also a good source of bone-building vitamin K and magnesium as well as heart-healthy copper, vitamin C, vitamin B6, folate, and niacin (**A. H. Ensminger *et al.*, 1986**).

Cucurbitaceous: Commonly consumed plants including pumpkin, watermelon, melon, horned melon, and cucumber belong to the Cucurbitaceae family and are prized for their high nutritional content and health-promoting qualities. The vital macronutrients, minerals, and bioactive substances that these plants offer add to their nutritional and medicinal value. The antidiabetic, hypolipidemic, antioxidant, and anticancer qualities of Cucurbitaceae plants in particular make them useful for treating metabolic diseases and reducing the health hazards brought on by oxidative stress (**Boreck, M. & Karaš M. 2025**). Additionally, it looks at their glycemic load, glycemic index, and caloric value, providing information about how they may be used in dietary plans for those with diabetes, obesity, or insulin resistance. This review also examines frequently disregarded by-products, such as seeds, leaves, and flowers, which are abundant in bioactive substances that may have health advantages. This review emphasizes the nutritional and functional potential of Cucurbitaceae plants by gathering and evaluating the available evidence, so reaffirming their importance in a diet that promotes health and prevents disease.

Conclusions

Consuming a diet high in vegetables on a regular basis has unquestionably beneficial benefits on health since the phytonutrients in vegetables can shield the body from a number of chronic illnesses. Vegetables reduce the risk of disease through a complicated and mostly unidentified method. The overall health benefit of the food is probably influenced by a number of its components. Numerous phytonutrients with antioxidant qualities can either directly or indirectly affect redox-sensitive cell signaling pathways by squelching free radicals. Blood pressure is regulated in part by nutrients like potassium. A large number of minerals and phytochemicals associated with the fiber matrix are transported through the human gut by the dietary fiber content and type of various vegetables, which may also help to improve bowel transit, lower cholesterol, and help control blood glucose levels. Lastly,

consuming more veggies may mean consuming fewer items high in calories, trans fats, and saturated fats, all of which may contribute to a healthy diet. Consumer-perceived nutritional quality that is reasonably priced may promote increased consumption, giving plant breeding a significant marketing advantage.

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