

DOI: 10.21767/1989-5216.1000249

Plant-Based Diets and Phytonutrients: Potential Health Benefits and Disease Prevention

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Received date: December 08, 2017; **Accepted date:** December 22, 2017; **Published date:** December 28, 2017

Citation: Poe K (2017). Plant-Based Diets and Phytonutrients: Potential Health Benefits and Disease Prevention Arch Med Vol No:9 Iss No:6:7

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Keywords: Phytonutrients; Plant-based diets; Beta-carotene; Antioxidants

Short Communication

A significant amount of research has been conducted on the correlation between a healthy diet and lifestyle, and significant reductions in diseases and their comorbidities. In addition, there is now focus being placed on the potential benefits of phytonutrients and a more plant-based diet, and their contributions to health promotion and disease prevention. Most significantly, phytonutrients are reported to have antioxidant and anti-carcinogenic properties, as well as a spectrum of potential tumor-blocking activities [1]. Phytonutrients (also called phytochemicals) are naturally occurring protective chemicals that are found in foods of plant origin and in plant-based diets. Studies show that there are as many as 100 different phytochemicals in just one serving of vegetables [2]. Each phytochemical comes from a variety of plant sources, and has different effects and benefits on the body. Some researchers estimate that there are up to 4000 phytochemicals in existence [3]. Plants utilize colors as their protective mechanisms, which are also their sources of phytonutrients [4]. Phytonutrients, as well as herbs and spices, are the basis for more than 40 percent of medications. They are medicinal in our bodies, and their defense mechanisms can be used to help optimize bodily functions [4]. Phytonutrients are often grouped into three categories. Polyphenols include the subgroup of flavonoids, which include resveratrol, quercetin, hesperidin, and anthocyanidins [5]. These flavonoids can be found in grapes, berries, broccoli, kale, and several other fruits and vegetables. Flavonoids may help prevent heart disease and cancer, lower blood pressure, and destroy some bacteria in food [5]. Isoflavones, which is a flavonoid found in soy, may imitate the actions of estrogen and play a role in alleviating symptoms of menopause, as well as protecting against some hormone dependent cancers [5]. Carotenoids are another group that include more readily discussed phytochemicals like beta-carotene, lycopene, lutein, and zeaxanthin [5]. They can be found in carrots, tomatoes, and watermelon, and may also reduce the risk of certain cancers, and have strong antioxidant effects [5]. Beta-carotene may help prevent night blindness and

age related macular degeneration. It may also potentially protect against certain types of cancer, and maintain healthy skin, hair, nails, gums, glands, bones and teeth [5]. Some of the best beta-carotene food sources are orange, yellow and dark green fruits and vegetables like carrots, sweet potatoes, squash, broccoli, kale, spinach, apricots, peaches, and cantaloupe [5]. Lutein and Zeaxanthin may protect against cataracts and age related macular degeneration [5]. Some great dietary sources include collard greens, kale, spinach, turnip greens, green peas, and broccoli [5]. Lycopene may also potentially protect against certain types of cancer (prostate, stomach, and lung), and include the dietary sources of tomatoes, pink grapefruit, watermelon, and pink guavas [5]. Allyl sulfides are the next group that are not discussed a great deal, but are found in garlic and onions, and may help strengthen the immune system [5]. The list could go on, but these are just few well-known and discussed phytonutrients and their potential benefits.

Phytochemicals are thought to be anti-inflammatory, detoxifying, anti-oxidant and hormone-balancing compounds that should be eaten every day to help prevent disease and create optimized health [4]. Evidence has shown that individuals who consume a diet rich in phytochemicals (fruits and vegetables) have lower rates of several disorders such as cardiovascular disease, diabetes, and certain types of cancer [2]. Maintaining a balanced diet that includes different forms and colors of fruits and vegetables provides the body with a variety of beneficial compounds [3]. "Phytochemicals have an antioxidant effect that protects cells from cancer and cardiovascular disease, as well as from urinary tract infections, rheumatoid arthritis, and reduced immunity" [2]. Most research on phytonutrients has been focused on the antioxidant effects that stabilize free radicals. Since excessive free radicals can damage DNA and other genetic material, it is no surprise that antioxidants are a focal point when discussing phytochemicals.

A healthy, plant-based diet includes plant foods in their whole form, especially vegetables, fruits, legumes, seeds, and nuts [6]. It limits animal products and total fat intake. It aims to maximize consumption of nutrient-dense plant foods while minimizing processed foods, oils, and animal foods [6]. In addition, it encourages a large quantity of vegetables (cooked or raw), fruits,

beans, peas, lentils, seeds, and nuts and is generally lower in fat [6].

In the 2003 article from the *Journal of Clinical Nutrition* entitled *Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals* [7], it was proposed that the additive and synergistic effects of phytochemicals in fruit and vegetables are responsible for their potent antioxidant and anticancer activities, and that the benefit of a diet rich in fruit and vegetables is attributed to the complex mixture of phytochemicals present in whole foods. Conclusions of the article showed that increasing the consumption of fruits and vegetables is a practical strategy for consumers to optimize their health and to reduce the risk of chronic diseases. In addition, another article entitled *Plant-based foods and prevention of cardiovascular disease in the American Journal of Clinical Nutrition* discusses evidence from prospective cohort studies which indicate that a high consumption of plant-based foods are associated with a significantly lower risk of coronary artery disease and stroke, as well as the prevention of other chronic diseases. In 2013, the *Permanente Journal* published an article entitled *Nutritional Update for Physicians: Plant-Based Diets* and noted that the major benefits for patients who decide to start a plant-based diet are the possibility of reducing the number of medications taken to treat a variety of chronic conditions, lowering body weight, decreasing cancer risk, and a reducing the risk of death from ischemic heart disease. Plant-based diets are associated with lower rates of heart disease, high blood pressure, diabetes, and obesity [6]. The *Adventist Health Studies* found that those consuming plant-based diets (vegetarians) have approximately half the risk of developing diabetes as non-vegetarians.

Although research on plant-based diets and specific phytonutrients in foods and their effects on disease risk are somewhat limited, there is enough evidence to suggest that consuming foods rich in these compounds may help prevent disease [8]. It is not known whether the health benefits are the result of individual phytochemicals, the interaction of various phytochemicals, the fiber content of plant foods, or the interaction of phytochemicals and the vitamins and minerals found in the same foods [8]. Thus, it is highly recommended to consume a diet rich in colorful fruits and vegetables for optimized health and wellness, and potential disease prevention.

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