

Healthy Benefits of Fruits

Waleed Fouad Abobatta*

Department of Citrus, Horticulture Research Institute, Agriculture Research Center, Egypt

***Corresponding Author:** Waleed Fouad Abobatta, Department of Citrus, Horticulture Research Institute, Agriculture Research Center, Egypt.

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Abstract

Fruits considered priceless sources of vitamins especially (C, A, B6, E, thiamine, and niacin), minerals, and dietary fiber, also, the fruit is a major component of a healthy diet, therefore, daily fruit consumption help in preventing various diseases include heart disease, strokes, and gastrointestinal cancers, also, help in enhancing wound healing.

Vitamin C as an antioxidant compound protects the body from oxidative stress and prevents other components from oxidation.

Carotenoids such as alfa and beta carotene have different benefits for human health like decreased risk of age-related macular degeneration and cataract, some cancers and coronary heart disease. There are many health benefits of citrus that include preserving blood vessels, tendons, help in cell division and play an important role in metabolism. While mango considered a valuable source of vitamin A which found in other fruits like nectarine, orange, peach, persimmon, and Nuts. Whereas, red fruits like apple, grape, peach, plum and pomegranate are a good source for flavonoids. Papaya has different benefits for human health like improve digestive, decreased risk of age-related macular degeneration, cataract, some heart disease, also, it has anti-inflammatory properties that enhance the bones, therefore, consume fruits that are rich in vitamins, minerals, and fiber leading to a healthy life.

Keywords: *Fruits; Vitamins; Carotenoids; Orange; Mango; Papaya*

Introduction

A fruit is defined as the edible part of a plant that consists of flush, the seeds, and surrounding tissues, and can be eaten as food and is components of a healthy diet, and help in preventing main diseases. Due to the healthy properties of fruits, they contribute to dietary guidance and play an important role in human nutrition; it's well documented as sources of various vitamins, minerals, micronutrient, and dietary fiber, also, daily fruits consumption reducing deficiencies of vitamin C and vitamin A [1], also, fruits regular consumption reduced risk for some forms of cancer, heart disease, stroke, and other chronic diseases [2]. According to FAO (2003) in the current era consumption of an adequate quantity of fruit and vegetables represent an important public health challenge.

The fruits like orange, apple, grapes, custard apple, peach, apricot, supply vitamin C, vitamin A, vitamin B6, vitamin E, thiamine, niacin magnesium, iron, fatty acids, minerals, also, nuts like almond, pecan, pistachio, and walnut considered a good source of important fiber, and the calories and other essential compounds like amino acids, zinc, and calcium.

There are different components in fruits considered strong antioxidants and could modify the metabolic activation and detoxification/disposition of carcinogens, or even influence processes that alter the course of the tumor cell [1], furthermore, daily consumption of fruits and nuts reduced hazards of some cancer, heart disease, stroke, and other chronic diseases [2].

There are different environmental factors like temperature, light, salinity, drought, and solar radiation that affect strongly on nutrition values of various crops [4]. Soil type, Rootstocks, agricultural practice such as irrigation, chemical fertilizers and soil characters influence the water and nutrient supply to the plant, which can affect the composition and quality attributes (appearance, texture, taste, and aroma) of the harvested plant parts [5], also, delays between harvest and consumption or processing can result in losses of flavor and nutritional quality. Also, exposure fruits to temperatures, relative humidity, and/or concentrations of oxygen, carbon dioxide, and ethylene outside the ranges that are optimum for each commodity during the entire postharvest handling system [6].

Moreover, cooking and preparing methods influence the nutritional value of fruits and nuts, therefore, it is better to consume a variety of commodities rather than limiting consumption to a few with the highest antioxidant capacity. This article provides an overview of the benefits of fruits and their role in human health.

The role of fruit in human health

Fruit is very important for human health, whereas low use causes dangerous effects like increased heart disease, strokes and gastrointestinal cancers worldwide, fruit and vegetables help reduce the risk of cardiovascular disease as well as some cancers through various mechanisms, including the provision of antioxidants, dietary fiber, and micronutrients such as carotenoids, flavonoids, vitamin C and folic acid, which can reduce oxidative damage and block the actions of carcinogens [7]. Fruits play an important role in reducing the risk of dangerous diseases through different mechanisms like the provision of antioxidants, vitamins, dietary fibers, and micronutrients which decrease oxidative hazards and reduce the activity of free radicals in the human cells. However poor dietary habits, particularly decrease fruits and vegetable quantity in daily food is among the leading risk factors for mortality worldwide [8].

What are vitamins?

The vitamin is essential compounds to regular metabolism, it's organic substances that are found with minute amounts in natural foods products, vitamins have an important role in protecting the human body from various diseases, there are currently 13 recognized vitamins (Table 1). There are different types of vitamins, some water-soluble like vitamin C and group of vitamin B, and other fat-soluble include vitamin A, D, E, and vitamin K. The human body cannot store Water-soluble vitamins, and it's extracted quickly in urine, therefore, the human body needs a daily supply of this vitamin [9].

Important caution about vitamins:

- All cooking destroys vitamin C.
- Freezing and canning could decrease B6 content.

Vitamin C: Why is it important?

Vitamin C also is known as L-ascorbic, ascorbic acid, or L-Ascorbate, is necessary nutrient and antioxidant for human health, vitamin C play important roles in human body include enhance and maintain bones, protect skin, and blood vessels, improves overall skin texture, production of collagen, L-carnitine, and some neurotransmitters.

Vitamin C soluble in the water; so, the body does not store it, there is a daily requirement for humans from vitamin c and food must contain an adequate amount of vitamin C. The adult person daily requirement is 90mg vitamin C, increased to 120mg during breastfeeding (according to The FDA's 2013), food storage for long period decrease vitamin C content, also, heating and cooking destroy it [11,12].

Vitamin C is a vital component in different tissues in the body like:

1. Tendons
2. Ligaments
3. Skin

4. Cornea
5. Cartilage
6. Bones
7. The gut
8. Blood vessels.

The main functions of vitamin C:

As an antioxidant compound, it protects the body from oxidative stress and prevents other components from oxidation, also, it helps the body to regenerate other antioxidants, so, Vitamin C could help in treating cancer patients.

There is important functions of vitamin C include:

1. In proteins metabolism
2. Minimizing the risks of some disease like cancer,
3. Repair tissue and decrease injuries from inflammation and oxidation.
4. Help prevent acute respiratory infections, particularly under malnutrition conditions and those who are physically stressed.
5. People with proper levels of vitamin C are more tolerant of off infections compared to people with vitamin C deficiency.

Vitamin C is occurs naturally in some foods, particularly fruits like orange (*Citrus sinensis*), lemon (*Citrus limon*), Sweet lime (*Citrus lime*), mandarin (*Citrus reticulata*), Grapefruit (*Citrus paradise*) [13], kiwifruit (*Actinidia deliciosa*), and Guava (*Psidium guajava*) [14].

The shortage of vitamin C causes scurvy disease which increases the cure period of wounds heals, also, the scurvy disease could infect any person who uses higher doses of vitamin c for a period and stop suddenly.

Carotenoids

Carotenoids are pigments found in various fruit, leafy vegetables, fungi, algae, and bacteria, there are about 650 different types of carotenoids are found in nature [15], it has different benefits for human health like decreased risk of age-related macular degeneration and cataract, some cancers and coronary heart disease [16].

There is a wide range of the function of Carotenoids in human health includes:

1. Eye health.
2. Cognitive performance.
3. Cardiovascular health
4. Bone health
5. Sun protection
6. Weight management
7. Infant nutrition
8. Cancer prevention
9. Immune function.

Health benefits of some common fruits:

There are different true fruit is known and have health benefits for humans includes orange, apple, pear, grapes, Mango, plum, Avocado, Dates, Guava, Custard apple, Figs, Kiwifruit, Cherry, Mandarin, Banana etc. (Table 1), also, fruits represent higher source of vitamins, fiber, and minerals like potassium, calcium, manganese, magnesium phosphorus, iron, sodium, copper and zinc, Phyto-nutrients like (Carot-

enoids, xanthin, and Lutein) [17].

Fruits	Scientific Name	Family	Health benefits
Orange	<i>Citrus sinensis</i>	<i>Rutaceae</i>	Prevent a kind of cancer like skin, lung, liver, breast, stomach, and colon, assist the heart function well, helps in preventing macular degeneration and improve eye vision, assist maintain blood pressure and regulate high blood pressure. it is a powerful antioxidant protecting the cells from free radicals.
Apple	<i>Malus domestica</i>	<i>Rosaceae</i>	Assist in decreasing cholesterol levels in the body, regular consumption minimizes the risk of skin diseases and detoxifies the liver.
Pears	<i>Pyrus Spp.</i>	<i>Rosaceae</i>	Pectin is prevented constipation and has a mild laxative effect.
Grapes	<i>Vitis vinifera</i>	<i>Vitaceae</i>	Fruits have an anti-allergic, anti-inflammatory, antimicrobial, and anti-cancer effect.
Mango	<i>Mangifra indica</i>	<i>Anacardiaceae</i>	Controlling blood pressure and heart rate, promotes good eyesight, and prevents night blindness.
Plums	<i>Prunus domestica</i>	<i>Rosaceae</i>	Regulate the functioning of the digestive system and relieve constipation, also, it's useful for eyesight and skin
Avocado	<i>Persea americana</i>	<i>Lauraceae</i>	Control the risk of heart disease, and regulate blood pressure.
Dates	Phoenix dactylifera	<i>Palmae</i>	Protect from some cancer and maintain the mucous membrane of the colon.
Guava	<i>Psidium guajava</i>	<i>Myrtaceae</i>	Preventive of cancers and anti-aging.
Custard apple	<i>Annona spp.</i>	<i>Annonaceae</i>	Useful for hair, eyes and healthy skin and against heart against diseases.
Figs	Ficus carica	<i>Moraceae</i>	Protect cells from scavenge harmful oxygen derived free radicals, also, induces good sleep and use to avoid insomnia.
Kiwifruit	<i>Actinidia deliciosa</i>	<i>Actinidiaceae,</i>	Considered a valuable source for dietary fiber, and reduce neuronal damage in the brain, so, it has some role in Alzheimer's disease.
Cherry	<i>Prunus cerasus</i>	<i>Rosaceae</i>	Useful against chronic painful diseases like gout arthritis, fibromyalgia, and sports injuries, and effective for assist in heart disease.
Mandarin	<i>Citrus retuclata</i>	<i>Rutaceae</i>	Control activity of free radicals and avoid cell damage.
Banana	<i>Musa paradiscum</i>	<i>Musaceae</i>	It has a valuable role in the treatment of neuritis and anemia and helps to the production of red blood cells.
Sweet lime	<i>Citrus lime</i>	<i>Rutaceae</i>	Use as a cure for the scurvy disease, and enhancing the digestive system.
Pomegranate	<i>Punica granetum</i>	<i>Lythraceae</i>	Has the best antioxidants of all fruits, reduce cholesterol, protect the heart from risks of disease, regulate blood tension.
Papaya	<i>Carica papaya</i>	<i>Caricaceae</i>	Helps protect eye vision, papain enzyme improves digestive system, enhancing bones due to anti-inflammatory properties, and helps in avoiding the risk of colon, prostate, lung and oral cavity cancers.
Lemon	<i>Citrus limon</i>	<i>Rutaceae</i>	Helps in digestion and assists dissolve kidney stones, useful in preventing scurvy, help to protect from cancers, helpful in control heart rate, and blood pressure.
Apricot	<i>Prunus armeniaca</i>	<i>Rosaceae</i>	Improve normal vision, the soluble fiber which promotes healthy blood glucose and cholesterol levels

Table 1: Health benefits of some different fruits.
Based on [7,9,11,12].

We discuss below some examples for these fruits which have numerous nutritional benefits.

Citrus: Citrus is a group of the fruits including orange, grapefruit, lemon, mandarin, tangerine, pomelo and kumquat (Figure 1), citrus fruits are essential sources of different nutrients and fiber like vitamin C, A, flavonoids, β -carotene, Potassium, Calcium, and Magnesium, [18], also, contain folate and thiamin, all this component which are antioxidants and has some anticancer properties and protect from heart diseases (Abobtta 2019b) [19], orange assist in regulation blood pressure helps in prevent macular degeneration and improve eye vision (Kandasamy and Shanmugapriya (2015) [17], vitamin-A which in oranges helps maintain blood pressure and regulating high blood pressure.



Figure 1: Egyptian citrus fruits (2019).

There are different healthy benefits of citrus (Figure 2) include:

- Vitamin C protects the body from free radicals that could destroy the body.
- Enhance wound healing.
- Keep blood vessels, tendons, ligaments and bone together.
- Folate is necessary for cell division in the human body.
- Thiamin has an essential role in metabolism.

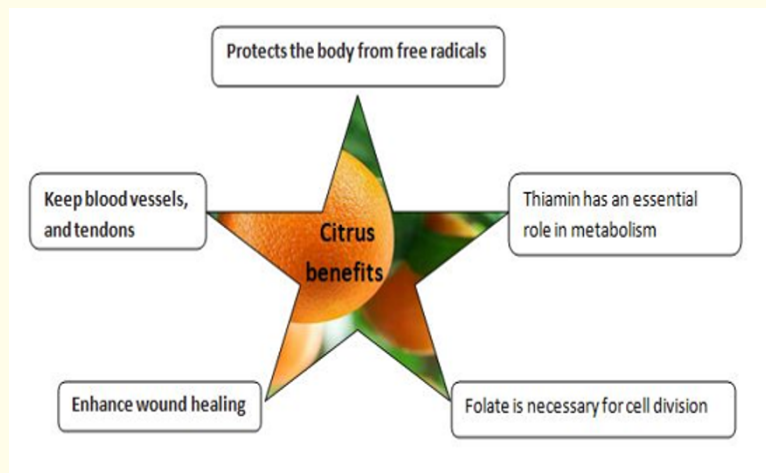


Figure 2: Schematic for citrus healthy benefits.

Mango fruits

Mango (*Mangifera indica*) is delicious fruits, there are different varieties of mango worldwide like Osten, Alphonso, and Tommy Atkins (Figure 3), it's called the "king of the fruits" due to nutritionally value and mango rich with exclusive flavor, fragrance, and taste, besides that, mango contains fiber, magnesium, total carotenoids and vitamin A [20].



Figure 3: Mango fruits (2019).

There are different benefits of regular consumption of mangoes (Figure 4), it helps in decreasing age-related cognitive decline, and reduce hazards of dangerous radiations consequently prevents some forms of cancer [21].

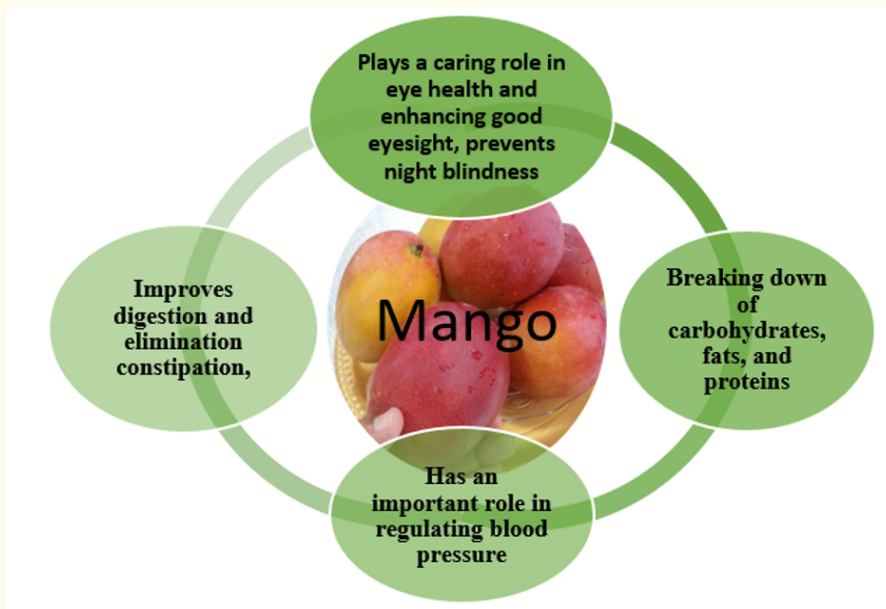


Figure 4: Schematic for healthy benefits of mango fruits.

Healthy benefits of mango

- There is an important role of fiber in metabolism, it helps in improves digestion and elimination of constipation, and, enhance es vitamin absorption.
- The peels contain enzymes that increase the breaking down of carbohydrates, fats, and proteins to be easier absorbable materials.
- Magnesium has an important role in regulating blood pressure.
- Vitamin A plays a caring role in eye health, and somehow protects the structure of the DNA.

Papaya

Papaya (*Carica papaya*) fruit is a valuable source of various nutrients, vitamins, and antioxidants, it includes carotenoids particularly alfa and beta carotene, "papain" enzyme, vitamin C, vitamin A, and low sugar content. Papaya fruit is very useful for human body, regarding vitamin C each fruit contain more than daily requirement [17], also, papaya fruit improve digestive due to digestive enzyme and fibers, papaya enhance bones due to it has antiinflammatory properties particularly seeds, it helps in protects different organs from cancer, papaya helps in protecting eye vision from degenerating as its rich with vitamin A.

Conclusion

The fruit is important for human nutrition, its valuable sources of vitamins, minerals, and fiber, also, the fruit is a major part of a healthy diet, all fruits have different health benefits like improving digestive, decreased the risk of age-related macular degeneration, cataract, some heart disease, enhance the bones. maintain blood vessels, and play an important role in metabolism, so, daily fruit consumption protects humans from different diseases like heart disease, strokes, and some cancers.

Citrus fruits have valuable benefits for the human body due to different antioxidants, vitamins, minerals, folate and thiamin, this entire component assist and protect human from heart diseases like heart diseases and have some anticancer properties.

Whereas mango, nectarine, orange, peach, persimmon, and nuts, considered a valuable source of vitamin A, while, red fruits like apple, grape, peach, plum and pomegranate are a good source for flavonoids.

Therefore, fruit daily consumption protects humans from different diseases and providing daily requirements from various vitamins particularly C and B vitamins.

Bibliography

1. Wargovich MJ. "Anticancer properties of fruits and vegetables". *HortScience* 35 (2000): 573-575.
2. Prior RL and Cao G. "Antioxidant phytochemicals in fruits and vegetables; diet and health implications". *HortScience* 35 (2000): 588-592.
3. The future of food and agriculture. Trends and challenges (2004).
4. Abobatta WF and Khalifa SM. "Influence of Hydrogel Composites Soil Conditioner on Navel Orange Growth and Productivity". *Journal of Agriculture and Horticulture Research* 2.2 (2019): 1-6.
5. Goldman IL., *et al.* "Influence of production, handling, and storage on phytonutrient content of foods". *Nutrition Reviews* 57.9 (1999): 46-52.
6. Lee SK and Kader AA. "Preharvest and postharvest factors influencing vitamin C content of horticultural crops". *Postharvest Biology and Technology* 20 (2000): 207-220.

7. World Health Organization. The world health report 2002-Reducing risks, promoting healthy life.
8. Global Burden of Disease. Causes of Death Collaborators. "Global, regional, and national age-sex specific mortality for 264 causes of death, 1980-2016: a systematic analysis for the Global Burden of Disease Study 2016". *Lancet* 390 (2016): 1151-1210.
9. Fact Sheet for Health Professionals Vitamin C. National Institute of Health (2019).
10. U.S. Food and Drug Administration. Guidance for Industry: A Food Labeling Guide (14. Appendix F: Calculate the Percent Daily Value for the Appropriate Nutrients) (2013).
11. Weinstein M., *et al.* "An orange a day keeps the doctor away: scurvy in the year 2000". *Pediatrics* 108 (2001): E55.
12. Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: National Academy Press (2000).
13. Abobatta WF. "Citrus Varieties in Egypt: An Impression". *International Research Journal of Applied Sciences* 1 (2019a): 63-66.
14. Kader A. "Importance of Fruits, Nuts, and Vegetables in Human Nutrition and Health". *Perishables Handling Quarterly* 106 (2001): 4-6.
15. Zimmer JP and Hammond BR. "Possible influences of lutein and zeaxanthin on the developing retina". *Clinical Ophthalmology* 1 (2007): 25-35.
16. Milani A., *et al.* "Carotenoids: biochemistry, pharmacology and treatment". *British Journal Pharmacology* 174 (2017): 1290-1324.
17. Kandasamy P and Shanmugapriya C. "Medicinal and Nutritional Characteristics of Fruits in Human Health". *Journal of Medicinal Plants Studies* 4.4 (2015): 124-131.
18. Organic Facts. 5 Incredible Benefits of Fruits (2018).
19. Abobatta WF. "Nutritional Benefits of Citrus Fruits". *American Journal of Biomedical Science and Research* 3.4 (2019b): 303-306.
20. Khalifa SM. "Evaluation studies on some mango varieties". M. Sc. Thesis, Al-Azhar, Univ, Egypt (2006): 166.
21. Lauricella M., *et al.* "Multifaceted Health Benefits of *Mangifera indica* L. (Mango): The Inestimable Value of Orchards Recently Planted in Sicilian Rural Areas". *Nutrients* 9 (2017).

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