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Medicinal value of walnut (*Juglansregia*) in Khost province, Afghanistan

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Abstract

Afghanistan's climate is suitable for agriculture, so majority of its people are busy with farming. One of the crops they cultivate is walnut. Walnut is a kind of fruit that contains important nutrients and is very important for our healthy diet. Therefore, consuming some amount of walnut per day can provide us with proteins, fat, antioxidants, some vitamins and minerals that people need daily. Also, walnut contains Omega3, useful for our regular health. Taking all these into account, we can conclude that walnut is a rich source of substances for health. If we are in searching for our healthy life, we have to consider daily intake of a handful of walnut.

Keywords: Botanical characteristics, walnut, carbohydrate, vitamin

1. Introduction

Walnut is a rich source of mono saturated fatty acid. Walnut contains omega 3, an essential fatty acid and arachidonic acid. This fruit has been known to people from the very past. Since its botanical structure resembles human brain, it is believed to be very nutritious to brain. Walnut is enriched with many phyto-chemical substances, which have antioxidant properties and comprise melatonin, ellagic acid, vitamin E, carotenoid, and polyphenols. These compounds can be used against aging, cancer, inflammation, and neurologic diseases^[14-15]. Afghanistan is semi-equatorial, agricultural country. Its climate is suitable for agriculture. This is why most of its people are farmers. One of the most cultivated plants is walnut, which is found in northern, eastern, and southern Afghanistan, specifically in khost province since its cultivation is relatively easy and inexpensive. In khost province, walnut is used for the remedy of numerous diseases such as Triglycerides, rheumatism etc. In addition to its curative properties, walnut is one of the sources of people's income as it is sold in many parts of Afghanistan and exported to foreign countries.

2. Walnut

2.1 Botanical characteristics of walnut

Walnut is harvested in March and April. It is hard-shell, oval dry fruit, which length can reaches up to 4-5 cm. it blooms in early spring, and it is a monoecious species bearing staminate and pistillate flowers separately on the same tree. Walnut is grown in regions which's height is 1500 -2200 meters above the sea level. The number of chromosomes is 32, and its classification is as follow^[14].

Classification of walnut

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Fagales

Family: Juglandaceae

Genus: Juglans

Species: J. Regia

2.2 Walnut is a source of vitamin

Walnut is rich source of vitamin E. Vitamin E can be found in walnut oil in two forms, either in form of tocopherol and gamma-tocopherol.

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It is estimated that 100 gram of walnut has 21 mg gamma-tocopherol vitamin E, which can supply human body with 140% daily needed vitamin. Vitamin E has potent fat solving properties, and it is used to protect the mucus and skin cell membrane to mitigate or prevent the harmful effects of free radicals [14].

Walnut has vital structures of vitamin. For instance, riboflavin, niacin, thiamine, pantothenic vitamin B6, and folate B9 can be found in it. Walnut can abate the danger of high blood pressure since it can prevent the effects of inflammation. Moreover, it is capable of preventing arterial illnesses which can result in heart and brain stroke, chest diseases, colon and prostate cancer [1-8].

2.3 Walnut contains protein, fat, and carbohydrate

Walnut holds single and multi-unsaturated fat that has harmful impacts on heart rate. Walnut fats contain roughly 75% of calories. We know that three types of food nutrients; protein, fats and carbohydrates; provide calories. 4 calories come from one gram of protein and carbohydrates. However, a single gram of fats contains 9 calories. This is why while consuming these hard-shell fruit; we have to pay attention not to over eat it! [4-15-16].

2.4 Consumption of walnut

Walnut can be consumed in various ways: it can be eaten directly, raw and unprocessed, or it can be used as roasted, salted, or flavored. The internal part of walnut is very delicious. This is why it has number of application. First, it can be used to improve the flavor of yogurt, Pizza, cake, salad, dessert, and walnut ice-cream. Second, walnut can be used in confectionery industries. It is used in producing cake, biscuit, and chocolate. Also, walnut can be used in making paste. Specifically, people who have peanut-allergy, they mostly depend on this kind of paste. Finally, in middle-eastern countries walnut is added to almond, date, and grape in order to create a cake called Mamoul, which is used in Ramadan [15].

2.5 Some other properties of walnut

Generally, hard-shell fruit and seed are the best food source. Walnut has various kinds of healthy material both in organic and raw forms. It feeds and supports the nervous system perfectly. Walnut is believed as food medicine which is able to offset the harmful effects caused by other types of food such as vegetable [15].

If walnut is consumed daily, it can be seen that it prevents many diseases. Because of its taste and medical advantages, walnut dessert is used since ancient times. Nowadays, we try to learn its benefits scientifically. Walnut resembles

brain in many ways. Brain looks like walnut. Its hard shell is analogous to the skull that covers the brain. Also, its two inner parts are similar to that of brain.

People impart their experiences and information about walnut from the very past. Some of the saturated and unsaturated fat acid can be found in certain amount of walnut. In 100 grams of walnut contain 50 grams (47.14) of multi-saturated fat, of which 40 grams (38.8) is Omega 6 (linoleic acid) and 10 grams (9.08g) is Omega 3 (linolenic acid). Compare to other hard shell nut, the rate of Omega 6 to omega 3 in walnut is very low [13-14]. This is a positive quality. Walnut's nutritive value is superior to that of pistachio, almond, hazelnut, pine nut, and peanut [18]. Although it has two times more antioxidant and vitamin than any other hard-shell nuts, people still consume other hard-shell nuts rather than walnut. So, it is vitally important that walnut should be included in nutrition programs.

2.6 Walnut keeps our hearts healthy

Some researches indicate that the daily consumption of walnut protect our body against heart diseases, some types of cancer, diabetes type 2, and other health problems. Recent studies have shown that walnuts lessen the dangers of heart attacks. Also, it facilitates the blood flow in the vein. What is more, walnut fruit resembles heart shape [6-7-2-13].

2.7 Walnut contains antioxidants

The effects of walnut antioxidants are 15 times more powerful than pure vitamin E. The fact that walnut has more antioxidants than any other hard-shell nuts, it is believed to be the best heart health friendly hard-shell fruit. Free radicals are responsible for damaging cells, encouraging stress, increasing cholesterol and inflammation [2-9]. In order to prevent free radical to do so, we have to consume more walnut, for it is a great source of antioxidant. (Anderson *et al.*) Morgan *et al.* When walnut was analyzed, it turned out that it has a better quality antioxidants compare to other nuts [18]. Antioxidants, received from 30 gram of walnut, are more than an individual human gets from vegetable and fruit in a day [11-3-5-10].

2.8 Walnut consumption is a good diet

Some people have misconception that consuming hard-shell nuts result in obesity. Of course walnuts have high value of calorie; nonetheless, they have healthy fats. So, consuming a handful of walnut not only keeps weight the same, but it also results in losing weight. The calorie gained from walnut can sustain our bodies until next meal. Also, antioxidants, attained from walnut keep us healthy [16-17-12].

Table 1. The chemical structure of walnut

Energy / Constituents	Nutritional value per 100 grams
Energy	2,738 kJ (654 kcal)
Carbohydrates	13.71
Starch	0.06
Sugars	2.61
Lactose	0
Dietary fiber	6.7
Total Fat	65.21
Saturated fat	6.126
Monounsaturated fat	8.933
Polyunsaturated fat	47.174
Protein	15.23
Vitamins	Amount (%)
Vitamin A equiv.	1 µg (0%)
Beta-carotene	12 µg (0%)
lutein zeaxanthin	9 µg (0%)
Vitamin A	20 IU
Thiamine (B1)	0.341 mg (30%)
Riboflavin (B2)	0.15 mg (13%)
Niacin (B3)	1.125 mg (8%)
Pantothenic acid (B5)	0.570 mg (11%)
Vitamin B6	0.537 mg (41%)
Folate (B9)	98 µg (25%)
Vitamin B12	0 µg (0%)
Vitamin C	1.3 mg (2%)
Vitamin D	0 µg (0%)
Vitamin D	0 IU (0%)
Vitamin E	0.7 mg (5%)
Vitamin K	2.7 µg (3%)
Trace metals	Amount (%)
Calcium	98 mg (10%)
Iron	2.91 mg (22%)
Magnesium	158 mg (45%)
Manganese	3.414 mg (163%)
Phosphorus	346 mg (49%)
Potassium	441 mg (9%)
Sodium	2 mg (0%)
Zinc	3.09 mg (33%)
Other constituents	Amount (%)
Water	4.07
Alcohol (ethanol)	0
Caffeine	0

Legend: µg = micrograms; mg = milligrams; IU = International units. Percentages are roughly approximated using US recommendations for adults (Source: USDA Nutrient Database).

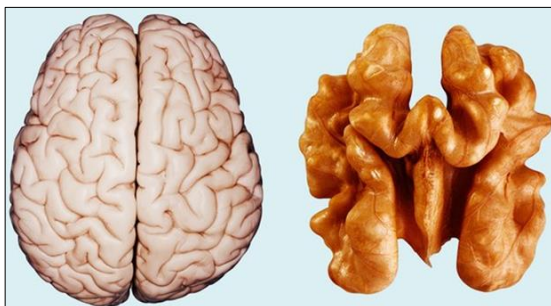


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3. Conclusion

Walnut has vitamin, minerals, protein, and fats, so they can be proved beneficial for human health. For the improvement of our heart and brain health, it is recommended that walnut to be consumed 30 grams daily from childhood. It is recommended that healthy nutrition organization include walnut in their programs since it can improve long time health of human beings. In Afghanistan, walnut can be used to cure some diseases such as cholesterol, triglyceride etc.

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