

Grape Berries: Few Nutritional Benefits

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Few plants and fruits have received as much attention in research and clinical trials as grapevine and grapes. One of the reasons is that grapes are included in many diets around the world and wine has been consumed for thousands of years, by the richest but also by the poorest. Excepting Antarctica, grapes are grown on all continents and scientists around the world have always been interested in this fruit. Grapes are compound fruits, with berries of different shapes and skin colour, with sweet flesh and seeds inside. There are about 10 000 grape varieties for table and wine, with colours which varies from green and yellow to red, or black, depending on the chemical compounds from skin and flesh. Grapes can be consumed either fresh or dried (raisins) and a large amount are converted in wine. Grape juice, also called the nectar of the gods, is considered one of the most beneficial refreshment liquid for our health. Opinions are divided, but despite the idea that it would have weight gain influence, grapes have the great quality of being among the fruits with the lowest glycemic index (values between 43 and 53), depending on the variety and also low-calories, about 70 per 100 grams [1]. Over time many health benefits offer by grape consumption have been found, due to their nutritional value.

Why should we eat grapes?

Grapes are rich in antioxidants, which can prevent chronic diseases. Over 1600 compounds have been identified in grapes [2]. Among plant compounds are antioxidants that protect cells from the harmful action of free radicals, which are responsible for oxidative stress which is considered to be associated with some chronic diseases, like cancer, diabetes, and heart disease. The highest content of antioxidants is found in the berry skin and seeds. From all the grape varieties, the red ones have the highest concentration of antioxidants [3]. A lot of phytonutrients are found in the composition of grapes, some of which are closely related to increasing life extension. At the top of the list is resveratrol, a phytonutrient present mainly in the berry skin, but also in the flesh and seeds [4]. Resveratrol stimulate the secretion in the body of the adiponectin hormone, and this prevents the development of many types of heart disease, protects blood vessels and reduces cancer risk. Regular consumption of grapes reduces the risk of inflammation, improves the glucose or insulin metabolism, while the seeds are extremely rich in beneficial oils and protect against blood clots [5]. It should be noted that antioxidants remain active even after the grapes fermentation, and that is why red wine is considered to be a drink with therapeutic properties, when is consumed with moderation [6].

Plant compounds from grapes can protect the body from certain forms of cancer. Grapes are rich in beneficial plant compounds, which can help in protection the body from certain forms of cancer. These include resveratrol, mentioned earlier, thanks to its anti-inflammatory properties and its specific action to block the development and spread of cancer cells [7]. Among beneficial grapes compounds, useful in cancer prevention can be found quercetin, catechin and anthocyanin [8].

Grapes consumption is beneficial for cardiovascular activity. There are several reasons why grapes consumption is good. First, grapes contain potassium which is essential for regulating blood pressure. Low levels of potassium in the body have been associated with the hypertension risk, heart disease, and heart stroke [9]. According to a 2011 study conducted on almost 13,000 adults, people who eat foods high in potassium are less at risk of dying from cardiovascular disease [9]. Second, the compounds found in grapes can adjust cholesterol levels by decreasing the absorption of cholesterol in the body [10].

Grapes consumption can lower blood sugar levels and prevent diabetes. Grapes contain sugar, and the question is if they are suitable for the diabetic diet. However, grapes have a low glycemic index, usually up to 53, and research suggests that certain compounds found in grapes may lower blood sugar levels [11]. In addition, resveratrol can regulate the insulin level in the body, therefore with significant benefits for diabetics due to the blocking action of the enzyme which converts the glucose into sorbitol; large amounts of sorbitol increase the level of oxidative stress and diabetes, as a result of the glucose assimilation imbalance [12]. In other words, “with resveratrol it’s easier to keep your blood sugar under control”.

Grapes compounds protect the health of the eyes. Research suggests that resveratrol and pycnogenol (substance important in the antioxidant process) can protect retinal cells in the human eye from ultraviolet radiation [13]. Regular consumption of black grapes helps to reduce the risk of developing certain ophthalmic diseases, which are associated with old age, (such as macular degeneration). Experts also suggest that resveratrol may protect the eye from glaucoma, cataracts and the diabetic eye. Last but not least, grapes contain lutein and zeaxanthin, two powerful antioxidants that can protect the eyes from the damage caused by blue light [14].

Grapes consumption can improve memory, learning, attention and other cognitive functions. According to recent research, supplements with grape extract or regular consumption of grapes can improve cognitive functions such as attention, ability to store information and verbal fluency. After resveratrol administration, cognitive and verbal memory improvement was observed and also the risk of cognitive decline in older women [15]. Experts also say that resveratrol can prevent Alzheimer’s disease, but more clinical trials are needed [16].

Grapes boost the immune system. Among the grape compounds are many beneficial vitamins, such as A, C and K which contribute to the well functioning of many systems in the human body, but especially the immune system [17]. In combination with polyphenols, vitamins increase the cells production of the immune system, called gamma-delta T cells (cells that act quickly against pathogens). Consuming grapes can help you stay away from the flu and cold [18].

Grapes contribute to: strengthen the bone system by minerals like calcium, phosphorus, potassium, magnesium, iron [19]; to purify the kidneys by eliminating stones naturally [20]; to relieve gout by removing uric acid [21]; participate in colon cleansing with laxative effect, and improves digestion (phosphorus, potassium and fiber are involved in the lipids decomposition and toxins elimination) [22]. The tannins from the skin have healing, antiseptic and astringent effect, and are used in cosmetics [23]. Eating grapes helps fight migraines and is an adjunct in relieving asthma [24]. Due to the content in carbohydrates and B vitamins, grapes are an energy supplier for the proper functioning of the nervous and muscular system [25].

Besides so many qualities, grapes can also show negative properties. Some people may have allergies to grapes, sometimes due not to the grape berries themselves but to the pesticides that have been used to control diseases and pests. Although they have a low caloric content, consumed in large quantities, grapes can favour weight gain. Excessive consumption can also have a laxative effect, sometimes causing abdominal cramps and diarrhea (Table 1).

100 g grapes	Amount
Calories	69 -72 kcal
Water	78.5 - 82.2 g
Glycemic index	45 -53
Proteins	0.55 – 0.86 g
CARBOHYDRATES	18.10 -18.13 g
- Fibres	0.60 – 1.7 g
- Starch	0.0 g
- Sugars	14.6 - 16.7 g
LIPIDS	0.07 – 0.31 g
- Saturated fats	0.05
- Polyunsaturated fats	0.04
- Monounsaturated fats	0.01
- Cholesterol	0.00 mg
- Trans fats	0.00
- Omega-3 fatty acids	0.01
- Omega-6 fatty acids	0.03
VITAMINS	
Vitamin A - Retinol	66.00 UI
Vitamin C - Ascorbic Acid	3.20 – 10.8 mg
Vitamin D - Calciferol	0.00 UI
Vitamin E - Tocopherol	0.11 – 0.28 mg
Vitamin K	8.3 - 18.10 mcg
Vitamin B1 - Thiamine	0.059 - 0.82 mg
Vitamin B2 - Riboflavin	0.049 - 0.108 mg
Vitamin B3 - Vit.PP - Niacin	0.164 - 0.264 mg
Vitamin B5 - Pantothenic Acid	0.0 - 0.05 mg
Vitamin B6 - Pyridoxine	0.00 – 0.086 mg
Vitamin B8 - Biotin	0.00 mg
Vitamin B9 - Folate	2.00 mcg
Vitamin B12 - Cyanocobalamin	0.00 mcg
Betaine	0.00 – 0.01 mg
ELECTROLYTES	
-Sodium	0.0- 9.00 mg
- Potassium	187- 191 mg
- Phosphorus	14 - 28 mg
MINERALS:	
- Calcium	6 -17 mg
- Copper	0.039 - 0.243 mg
- Iron	0.14 - 1.13 mg
- Magnesium	0.035 – 0.116 mg
- Manganese	0.071 mg
- Zinc	0.03 – 0.21 mg
PHYTO-NUTRIENTS	
- Alpha-carotene	1 mcg
- Beta carotene	39 mcg
- Lutein	72 mcg

Table 1

Nutritional composition for grapes can be little different, depending on variety, soil, area of growing or climate variability during growing season. However, generally the main nutrients found in grape berries (100 g) are [27].

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