

DOI: <https://doi.org/10.5281/zenodo.11144447>

## GETTING ANTIOXIDANTS AND OTHER BENEFITS FROM WILD BLUEBERRIES

**Tukhtaboev Mokhirjon Rakhimjanovich**

senior lecturer of the "Biotechnology" department of Namangan State University  
[mtuxtaboyev@mail.ru](mailto:mtuxtaboyev@mail.ru)

**Annotation:** *Blueberries are used as food and for making liqueurs, jelly, jam, and pies. Also stored frozen. In many places, berry picking brings significant income to the population. Blueberries are low in fruit acids. But they are high in A and B vitamins, manganese, fiber and flavonoids. Berries are a good source of vitamin C, magnesium and calcium. A good honey plant, produces a lot of nectar. Fragrant honey is light, slightly reddish. The nectar productivity of one flower in the conditions of the widespread in north Euro Asia and North America in shady places is 0.3 mg, in semi-shaded places 0.4-0.5 mg. The coloring matter of blueberries is a (pH) indicator and changes color to blue when the acidity decreases.*

**Key words:** *anthos, kuanos, anthocyanin, anthocyanidin, pelagonidin, cyanidation, peonidin, absorbance, inflammation.*

**Intruduction.** Wild blueberries are rich in manganese, vitamin K and fiber. Wild blueberries also have some of the highest levels of antioxidants, including anthocyanins . The word anthocyanin comes from *anthos* (flower) and *kuanos* (blue) and gives fruits such as wild blueberries, blackberries, eggplant and cabbage the beautiful blue-violet hues they retain. In addition to its attractive appearance, anthocyanin is a powerful antioxidant that has proven health benefits. Blueberries are used as a purple vegetable dye, for example, for branding meat. The juice of the berries, using various mordants, dyes wool and canvas purple and red <sup>[1]</sup>. You enter a blueberry meadow from the edge. First, bend over, then on your knees, and then lying down, you crawl in a spiral towards the center - it's not for nothing that blueberries are called "creeper". Sometimes you get so excited that you don't even notice that the bucket is already full.

Devices for picking blueberries are made of different materials: metal, plastic or wood. In Euro Asia, there is an industrial production of plastic devices in the form of a "closed bucket" (some with a protective curtain so that the berries do not spill out when tilted). The device allows you to pick berries that are difficult to pick up with

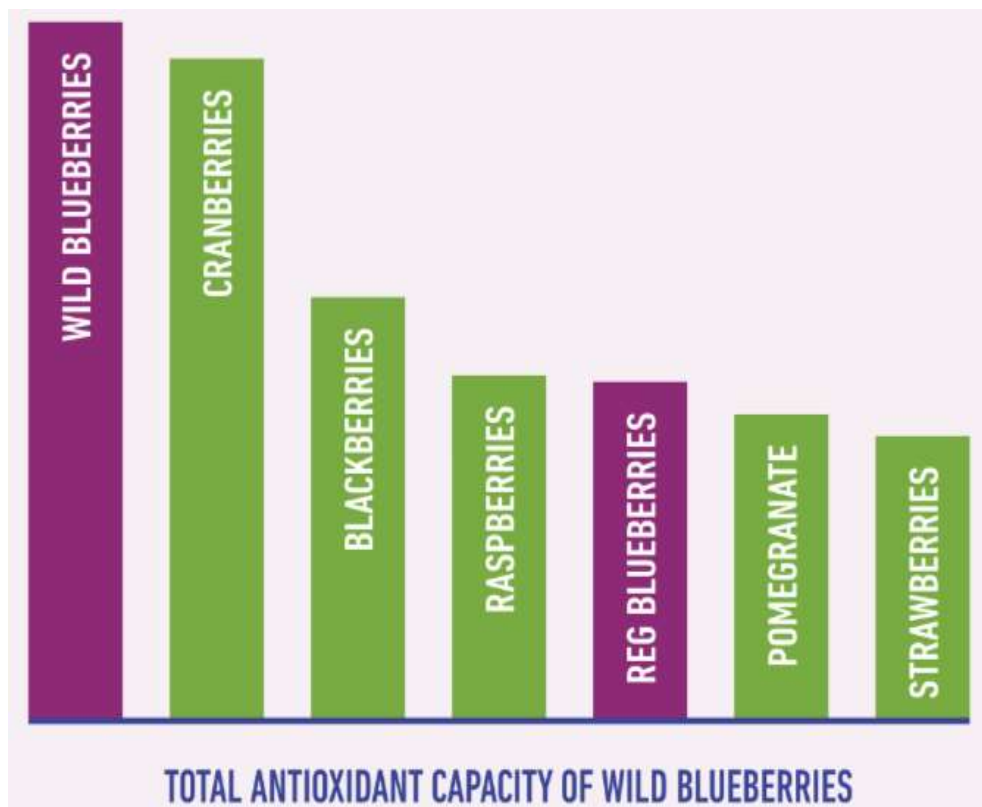
your hands: small, wet. In addition, picking with a device reduces contact of the berry with the skin of the hands, which pickers treat with repellents against blood-sucking insects. As a result, the likelihood of repellent getting into food with collected berries is reduced.



**What are anthocyanins?** Anthocyanins, often found in the roots, stems and especially leaves of plants, occur in two forms. When a sugar is attached to the molecule it is called *anthocyanin*, however without the sugar molecule it is called *anthocyanidin* <sup>[5]</sup>. There are three broad classifications of anthocyanins, which are grouped by their health benefits and how the antioxidant is metabolized and absorbed. In a study by Dr. Jim Fang of the University of Saskatchewan, he basically classified anthocyanins into one of three categories: pelargonidin, cyanidation / peonidin, or a group of multiple anthocyanins. In general, anthocyanin's are known to protect plants from stress factors such as ultraviolet radiation, low temperatures and drought<sup>[6]</sup>. It's no wonder antioxidants like anthocyanins are so effective. **What do antioxidants do?** Antioxidants are simply playing a game of "cops and robbers" where antioxidants are the cops and free radicals are the robbers. The daily presence of cops (antioxidants) can deter robbers (radicals) and ensure peace in the city (your body). The more antioxidants you consume, the more protection your body will have against free radicals that can wreak havoc on our bodies on a daily basis. In fact, there are many systematic studies that link high anthocyanin intake to lower incidence (new cases) of cardiovascular disease, diabetes, and cancer. However, more research is needed to determine the recommended daily intake of anthocyanins.

Twice the antioxidants of ordinary blueberries. When you want blueberries, pick wild. feed your brain the good stuff. The antioxidant king, wild blueberries have two times more antioxidants than even ordinary blueberries. And they're jam-packed (no pun intended) with anthocyanin's, which give them their deep purplish color and have been shown to fight inflammation in humans.

Orac of Selected Foods, USDA-ARS, May 2023 Main Scores for Total ORAC ( $\mu$ ) m a Tiny Nutritional powerhouse. Compared to ordinary blueberries, wild Maine blueberries have...\* ol TE/100 g and mg GAE /100g.



The main active ingredients are condensed tannins (5-7%), anthocyanins, pectin, tannins, flavonols (quercetin and catechin). The high anthocyanin content of blueberries ranges from 300 to 700 mg per 100 g. Glutamic acid and valine are the predominant amino acids in blueberries. Berries and leaves are used in scientific and folk medicine. They are used for diseases of the eyes, gastrointestinal tract, diabetes and gerontology, as well as topically for the treatment of burns and ulcers, stomatitis and gingivitis. An infusion or decoction of dry berries helps with diarrhea. The fresh berry is considered useful in treating scurvy.

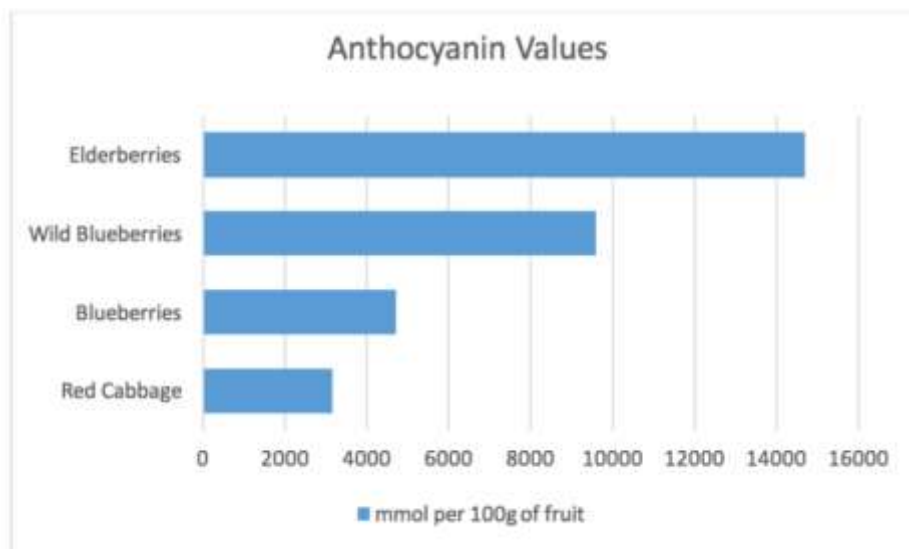
Leaves and shoots are used in early forms of diabetes, since the glycoside neomyrtillin they contain has the ability to lower blood sugar [7].

When consumed in large quantities, blueberries cause constipation [22].

| Amount per serving       |           |
|--------------------------|-----------|
| <b>Calories</b>          | <b>80</b> |
| <b>% Daily Value*</b>    |           |
| Total Fat 0g             | 0%        |
| Saturated Fat 0g         | 0%        |
| Trans Fat 0g             | 0%        |
| Cholesterol 0mg          | 0%        |
| Sodium 0mg               | 0%        |
| Total Carbohydrate 19g   | 7%        |
| Dietary Fiber 6g         | 21%       |
| Total Sugars 10g         |           |
| Includes 0g Added Sugars | 0%        |
| Protein 0g               |           |
| Vitamin D 0mcg           | 0%        |
| Calcium 24mg             | 2%        |
| Iron 1mg                 | 6%        |
| Potassium 95mg           | 2%        |
| Zinc 1mg                 | 10%       |
| Manganese 4mg            | 170%      |

\* USDA/Food Data Central legacy analysis of 1 cup frozen wild blueberries vs. 1 cup raw blueberries.  
<https://fdc.nal.usda.gov/>

The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2000 calories a day is used for general nutrition advice. And while consumers are becoming increasingly aware of antioxidants such as anthocyanins, in 2012 the Food for Better Health Foundation found that only 3% of fruits and vegetables consumed were purple or blue [5]. Knowing some foods that are high in antioxidants can help us get the most out of every bite. Antioxidant levels in foods are measured using the Oxygen Radical Absorbance Capacity (ORAC) test. Elderberries lead the pack, followed by wild blueberries, high blueberries, red cabbage and purple carrots, which round out the top five anthocyanin-rich foods [5].



### What does research say about anthocyanins?

*Cognitive functions.* Whether you're 5 years old or 95, research has shown that anthocyanins can improve cognitive functions such as memory and everyday mental function. In a study conducted in the UK, Professor Claire Williams and her research team found that children performed better on cognitive tasks after drinking a wild blueberry drink than when they did not <sup>[1]</sup>. Similar results have been presented to show the beneficial effects of anthocyanin intake on working memory in older adults<sup>[3]</sup>. Researchers suggest that anthocyanins have the potential to reduce inflammation, thereby improving blood flow and improving communication between brain cells<sup>[7]</sup>. Foods rich in anthocyanins, classified as cyanidin and peonidin, have a greater effect on reducing inflammation.

*Natural anti-inflammatory agent.* Inflammation is a silent killer. Low-grade inflammation is one of the main mechanisms responsible for many chronic diseases such as obesity and hypertension. Although the mechanism of inflammation is complex and involves various components at the cellular level, research has shown that foods such as berries, especially blueberries and wild blueberries, have anti-inflammatory effects. Inflammation is often exacerbated by a high-fat diet. A study from Finland examined the effects of anti-inflammatory foods such as blueberries and wild blueberries on rats consuming a high-fat diet <sup>2</sup>. The results showed that a high-fat diet combined with whole berries caused less of an inflammatory response compared to rats consuming a high-fat diet alone. In addition to their anti-inflammatory effects, foods rich in anthocyanins improve insulin sensitivity.

*Antidiabetic.* Results from a study of three different groups of anthocyanins showed that blueberries are able to induce insulin secretion<sup>[4]</sup>. Type 2 diabetics often have insulin insensitivity and release lower levels of insulin when they consume glucose compared to people without diabetes. Eating wild blueberries and red cabbage may be part of dietary recommendations to prevent and treat diabetes and even heart disease.

**Method-Happy heart.** In the United States, 90% of women have at least one risk factor for cardiovascular disease. Since it is one of the leading causes of death among women, it is beneficial for us to integrate preventive measures to curb this problem. In the Nurses' Health Study I and II and the Women's Health Study, researchers found that those who consumed anthocyanin-rich foods could reduce their risk of hypertension, coronary heart disease, and cardiovascular disease by 8–12% <sup>3</sup>. By studying the diets of the subjects, the researchers found that these people consumed anthocyanins mainly from blueberries and strawberries. The results suggest that anthocyanins may reduce arterial stiffness and therefore lower blood pressure and

reduce damage to blood vessels and the heart, ultimately reducing the risk of heart disease.

There are many benefits to consuming a diet high in antioxidants. Rather than focusing on diets that only have anti-inflammatory, anti-aging, or anti-diabetic effects, we recommend increasing your diet high in anthocyanins. Not only will it add a beautiful color to your plate and give your tongue a beautiful purple-blue color, but it also provides a number of health benefits, helping to manage and prevent conditions and diseases such as cognitive decline, inflammation, diabetes and heart disease.



**DISCUSSION**-Cultivated and harvested for over 10,000 years, wild blueberries have grown in the badlands of Maine. One of the few fruits native to North America, wild blueberries are cared for by stewards—dedicated men and women who work with the berries using best practices passed down through generations. Thanks to their love of wildlife, we can enjoy the best blueberries around.

**Efforts all year round.**

Unforgiving winters. Later sources. Hot growing season. In the fall, it's time to recharge. Each season plays a different role for Maine wild blueberries.



**WINTER** Wild blueberries are grown on a two-year cycle: each year, half of the grower's land is cultivated to promote vegetative growth, and the other half is prepared for harvest. And it all starts with winter. Lack of sunlight and long cold weather - the season is not for the faint of heart .

It's these conditions that cause wild Maine blueberries to accumulate the protective antioxidants and anthocyanins that make this tiny berry a super food with amazing flavor.



**SPRING** As winter loosens its grip, patches of green appear around patches of melting snow. Millions of bees begin their work pollinating the bushes that surround the ground, ready to resume the growth cycle that has occurred every year for 10,000 years. These bees, including native bumblebees and honeybees, are very

important to wild blueberry growers, who are committed to conserving wild bees through conservation practices.



**SUMMER** Wild blueberry bushes, soaked in the Maine summer sun, explode in shades of purple and blue. This is when Maine wild blueberries are picked at peak freshness, sold at farmers markets, or flash frozen to preserve what has grown throughout the season. Wild blueberries are sorted, cleaned and processed within

hours of picking.



**AUTUMN** When the coolness in the air returns, it is a signal that the bushes should be trimmed and prepared for the long winter ahead. Firmly committed to best farming practices, wild blueberry growers use sustainable management practices to ensure healthy harvests and protect wild blueberry lands for future generations.

## REFERENCES

1. Mikkanen O.T., Huotari A., Herzig K.H., Dunlop T.V., Mikkanen H. and Kirjavainen P.V. (2014). Wild blueberry ( *Vaccinium myrtillus* ) alleviates inflammation and hypertension associated with the development of obesity in mice fed a high-fat diet. *Plo S one* , 9 (12), e114790.
2. Norberto , S., Silva, S., Meireles , M., Faria , A., Pintado , M., & Calhau, C. (2013). Blueberry anthocyanins in health promotion: a review of metabolism. *Journal of Functional Foods* , 5 (4), 1518–1528.
3. Fang, J. (2015). Classification of fruits based on types of anthocyanins and their effects on health. *Nutrition* , 31 (11), 1301-1306.
4. Thompson K, Pederick V, Santhakumar AB. Anthocyanins in obesity - associated thrombogenesis : a review of the potential mechanism of action. *Power function*. 2016;7(5):2169-2178.
5. Донсков Д. Лесные девицы — черницы и голубицы // Наука и жизнь. — 2020. — № 8. — С. 2
6. <http://www.telegraph.co.uk/food-and-drink/news/blueberry-juice-boosts-brainpower/>
7. <http://www.todaysdietitian.com/nearchives/030314p20.shtml>
8. <http://www.todaysdietitian.com/nearchives/0716p18.shtml>