The XIIth UEAA Meeting in Bucharest, Romania
"New Research Techniques and the Agricultural Progress"

BETTER CAPITALIZATION OF THE ORGANIC WHITE SEA BUCKTHORN(HIPPOPHAË RHAMNOIDES L.) AND BLUEBERRY FRUITS (*VACCINIUM MYRTILLUS L*) AS FUNCTIONAL FOODS

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Abstract:
The present study evaluates the quality of white sea buckthorn and blueberry fruits from national organic crops based on indices provided by internal standards or norms, applying the organoleptic examination, complete with specific measurements, and different physico-chemical methods (determination of humidity, total acidity, sugar content and raw ash). The results confirm that for fruits, the quality is influenced by varierty, by pedoclimatic conditions and the applied agrotechnics. Through their nutritional intake combined with the mineralizing effect, these products acquire functional food value, due to the sanogenic potential induced by their complex chemical composition. Thus, obtaining fruits from organically certified white sea buckthorn and blueberries raises to the superlative their use as functional foods, dietary supplement, with a reduced production input.

Keywords – white sea buckthorn fruits, blueberries, quality, capitalization, functional foods.

INTRODUCTION:

The genetic center of the white sea buckthorn (*Hippophae rhamnoides L.- fam. Elaeagnaceae*) is in Central Asia, where the conditions for its growth and development are the most favorable. As an Eurasian species, sea buckthorn has a huge range, from the Atlantic Ocean to the Pacific Ocean. In Asia, it reaches the Indian Ocean at 23° latitude and in Europe it reaches at 67° latitude in Norway. In altitude, it can be found up to 2000 m in the Alps and 5000 m in the Himalayas (Stănescu V., Şofletea N., Popescu O, 1997).

It is highly valued in pharmacology, the food industry, animal feed, forestry and as an ornamental plant in arboreal spaces. Research carried out in Romania by pharmacologist Emil Grigorescu, biochemist Ion Brad - full member of ASAS, Food Industry Section, the specialists in forestry science, Atanasie Haralamb, Silviu Corlățeanu, Eugen Beldeanu, Emil Untaru, Constantin Traci and others, demonstrated the importance of this species in various fields. [**1"Forest Progress", 2018].

Today, sea buckthorn is considered one of the most valuable species of fruiting shrubs, both from the wild and cultivated flora. Worldwide, the first white sea buckthorn plantations were established in Russia, followed by Germany, Poland and Hungary. In Romania, the first plantations of white sea buckthorn were carried out in forestry to fix and exploit the degraded lands in the hilly areas and the quicksands of Letea, Cardon, Sfištovca and Sfântul Gheorghe. The first experimental plantations were established at the ICPP Insitute of Mărăcineni-Pitesti within ASAS and the Agronomic Institute of Iași (IA Iaşi being the first agricultural institution to introduce the white sea buckthorn in fruit growing). During the communist regime, Iasi county had 70 ha of organized sea buckthorn plantations in Bârnova, Dagâța, Dolhești, Rediu and Adamachi. The most suitable soils for sea buckthorn culture are alluvial, sandy, light and well-drained, which allow effective aeration of the roots. These soils should have a slightly acidic, neutral or slightly alkaline reaction, with an ideal pH between 6.5-7.5 and maintain an optimal humidity of about 70%. If the humidity is not adequate, the amount of fruit can be significantly reduced. Sea buckthorn requires soils rich in mineral nutrients, especially phosphorus, which is essential for normal root nodule development and overall plant health. Also, the plant needs direct and abundant light from the first stages of growth, as the shade is not tolerated. To

have an effective sea buckthorn crop, it is necessary to plant both female cultivars, which produce fruit, and male cultivars, needed for pollination. The optimal ratio of female to male plants should be between 6-12% to ensure consistent and quality fruit yield. Sea buckthorn fruits begin to ripen in the second half of August and continue to ripen until the beginning of October. The high temperature during this period helps the formation of carotenoids, while rainy conditions and moderate temperatures favor the development of ascorbic acid in the fruit. (Pârvu Ctin., 2002-2005).

Blueberry (*Vaccinium myrtillus L.- Ericaceae family*) is a small fruit bush which can be found in Europe, northern Asia, Greenland, western Canada and the western United States. It is a mountain species, growing from the lower limit of the spruce to the alpine zone. In our country it is found in the whole Carpathian chain, in all mountain areas. The blueberry is a bushy and branchy subshrub with a green stem, about 30-60 cm long and angular branches. The leaves are short-petiolate, small, oval and denticulate on the edges, green on both sides. The flowers are greenish-reddish, white or pink, with petals joined in the shape of a bell, arranged one or two at the axil of the leaves. Flowering takes place in the months of May-June. The fruits, known as blueberries, are dark blue or dark blue berries, with a diameter of 0.5-0.6 cm. They are juicy, with a purplish juice and have a pleasant, sweet-sour taste. (Pârvu C.tin.,2005).
According to the paper "*Fruit trees cultivation for all*" (Tănăsescu N., 2005), the blueberry bush was cultivated for the first time in North America in 1890 and arrived in Europe in 1930. In Romania, the first blueberry plantation was established in 1968 within of research Institute for Fruit Growing Pitești- Argeș, Romania.
Blueberry crop requires acidic, well-drained soils with a pH between 4.5-5.5. The blueberry prefers areas with a temperate and humid climate, being resistant to low temperatures, but sensitive to drought. Blueberry planting is usually done in autumn or early spring. The recommended distance between rows is 2.5-3 meters, and between plants, 1-1.5 meters. Planting pits should be 40 x 40 cm in size and 30-40 cm deep. Planting material must be certified to ensure a healthy and productive crop. After planting, the shrubs should be watered abundantly and the soil mulched to maintain moisture. In the first two years, it is important to carry out training cuts to develop an optimal structure of the bush. Maintenance, fruiting and rejuvenation pruning is carried out annually to stimulate fruit production. Blueberry harvesting is done by hand or mechanized, depending on the size of the plantation, when they are fully ripe, having an intense color and a sweet-sour taste. Harvesting must be done carefully to avoid damage to the fruits, which are sensitive and perishable. After harvesting, blueberries can be eaten fresh, frozen or processed into various products such as: jams, juices and desserts. With proper care and compliance with cultivation conditions, the blueberry can offer consistent and quality productions, contributing to the diversification of the supply of fresh and healthy fruits. (Tănăsescu N., 2005),

MATERIALS AND METHODS:
Obtaining fruits from organically certified crops (white sea buckthorn and blueberries) with a high quality value meet the highest level requirement for human consumption. In order to benefit from the entire functional role, it is recommended that foods be consumed in their integral form. Due to their nutritional value fruits, rich in antioxidants, these organic fruits (white sea buckthorn and blueberries) are recognized for their functional food value, providing health benefits due to their complex chemical composition. In this way, are obtained functional finished products such as food and food supplements with a low production input.
The quality of white sea buckthorn fruits and blueberries from organic crops can be evaluated based on:

- the indices provided by national standards or norms,
- organoleptic examination,
- specific measurements - weighing and different physico-chemical methods (determination of humidity, total acidity, sugar content and raw ash).

The white sea sea buckthorn fruits come from a company established in 2011 in Lichitiseni-Vultureni, Bacău county, Romania, with the main object of activity the cultivation of fruit bushes and other tree species. The company exploits an area of approx. 98 ha of agricultural land of which approx. 28.00 ha are cultivated with sea buckthorn - ecologically certified by ECO INSPECT SRL (RO-ECO-008). The varieties chosen for the establishment of the plantation (4) and also for our study were: Clara - female variety, Mara - female variety, Cora - female variety, Andros - male variety.

(a) The blueberries samples for our study come from organic farming (hand-picked) within a company established in 2008 in in Hârseni village, Făgăraşi, Braşov county, Romania, whose main object of activity is the cultivation of fruit trees, strawberries, nut trees and other fruit trees,), producer ecologically certified by SC ECOINSPECT SRL (RO-ECO-008), through Certificate number RO-ECO-008.642-0002137.2023.001

The following organoleptic quality indices were determined for fruits:
- harvesting proper time and method: they are picked carefully, when they have reached the size and color characteristic of the variety, to be able to withstand transport and subsequent handling;
- color and skin appearance: they must be uniformly ripe and have the shape, size and color characteristic of the specific variety. The color and appearance of the skin is assessed visually, ideally in natural light. It is important that the skin is clean, without bumps, without traces of insecticidal or fungicidal substances. The smoothness of the skin, the degree of gloss, as well as the absence of wrinkles and cracks are appreciated;
- freshness: it is assessed organoleptically by checking the turgidity and the natural appearance of the fruit (which indicates the time elapsed since harvesting and the way in which the fruits were stored).
- health and cleanliness: it is checked visually or with the help of a magnifying glass, to establish the percentage of fruit affected by diseases and pests, as well as the presence of dirt or traces of antiparasitic substances (if there are suspicions of antiparasitic substances, their toxicity must be confirmed by analyzes laboratory).
- the degree of maturity: essential for determining the destination (consumption or processing), it is determined by the color of the skin, the consistency of the pulp, taste and aroma (ripe fruits must have a uniform color and a pulp that corresponds to the characteristics of the variety).
- *taste:*it must be characteristic of each variety and species (positive qualities are considered if the fruit has a well-balanced sweetness with acidity and a fine astringency; the negative taste includes an excessively astringent, bland or grassy pulp).
- *aroma:*it is evaluated in a clean room, without external odors, by tasting (positive qualities are considered a well-defined and pleasant aroma; negative aromas indicate a weakly aromatic pulp, with the smell of grass or foreign smell, unpleasant and not specific to the variety).
- the internal defects of the fruits: they are identified by longitudinal or transversal sectioning of a number of 10-20 fruits from the sample. (Muste Sevastița, Crina Muresan, 2011)

The physico-chemical quality indices used in determining fruit quality included the determination of: humidity, total acidity, sugar content and raw ash.
- *determination of humidity* - it is carried out by the refractometric method (the Abbe Zeiss refractometer is used. The percentage of soluble dry matter is read directly from the scale of the refractometer. The formula applies: U = 100 - SU (where SU represents the percentage of soluble dry matter).
- the determination of total acidity is carried out by neutralizing the acids present in the sample with a 0.1 N sodium hydroxide solution, using phenolphthalein as an indicator to detect the moment when the titration reaction is complete. The formula is applied: % Acidity = V × 0.0067 × 2 × 10 (where V is the volume of sodium hydroxide 0.1 N used - in ml).
- *determining the sugar content*- the process involves: sample preparation, heating precipitation, completion and filtration. The obtained filtrate represents the primary solution.

* the determination of the direct reducing sugar is carried out according to the Bertrand or Schoorl method, using an appropriate amount of the primary solution. (the Schoorl method is based on the ability of simple sugars to reduce Fehling's solution; the resulting copper sulfate is measured iodometrically). Results are expressed in invert sugar.
* determination of total sugar involves taking 50 ml of the primary solution, in a 100 ml volumetric flask, by the Bertrand or Schoorl method (the Bertrand method is based on the property of sugars to reduce Fehling's solution to cuprous oxide/Cu2O; it is treated with a solution ferric sulfate acid, and the resulting ferrous sulfate is titrated with a 0.1N potassium permanganate solution, up to a pale pink coloration).
- *determination of ash content* (the ash represents the residue obtained by the complete combustion of the organic substances in the composition of the analyzed product; it includes both the mineral substances present in the product and mineral impurities accidentally found in the sample). The mineral substances are determined by calcination at a temperature of 550-600°C, until obtaining a white ash, free of coal. The formula applies: C = G1/mx 100 g% ash (where G1 is the mass of the ash residue and m is the initial mass of the sample) (in g).

RESULTS AND DISCUSSION:
Those foods that contain a nutritious bioactive component (vitamins, minerals, proteins etc.) or non-nutritive (prebiotic fibers, polyphenols) are considered conventional (unmodified) "functional" foods. In order to benefit from the entire functional role, it is recommended that foods be consumed in their integral form. The more a product is processed, the more it can lose the vitamins, minerals or fibers that make it a functional food. They provide a positively influence on body functioning; they protect against the occurrence of diseases, prevent nutritional deficits and can helps the normal growth and development of children. Thus, obtaining fruits from organically certified buckthorn and blueberries raises to the superlative their use as functional foods.

- For sea buckthorn crop, we studied the behavior of some autochthonous varieties under certain pedoclimatic conditions (within an ecological farm from Bacău county, Vultureni village) in order to certify the ecological yield. (Vlăsceanu, Popa, Brumă, 2023), such as:
  - Clara variety (female plant) ;
  - Mara variety (female plant) ;
  - Cora variety (female plant) ;
  - Andros variety (male plant).

The ratio of male and female plants recommended for setting up a plantation of sea buckthorn is 1:8.

***Figure 1.*- Clara variety (female plant)**

Figure 2. **Mara variety (female plant)**

Figure 3. **Cora variety (female)**

Figure 4. **Andros variety (male plant)**

The quality of white sea buckthorn fruits from ecological crop was assessed by applying the organoleptic examination (fig. 5,6,7), completed with specific measurements (number of berries per branch, quantity in grams of berries on a branch) - indicators provided for in the standards and internal rules. (as in Table 1)

Figure 5. **Clara variety (organoleptic examination)**

Figure 6. **Mara variety (organoleptic examination)**

Figure 7. **Cora variety (organoleptic examination)**

Table 1. Productivity of the studied sea buckthorn female varieties

Parameters	Clara	Mara	Cora
Number of berries per branch	297	**207**	272
Amount of berries per branch/ in grams	**113**	**85**	**107**

Table 2. Physico-chemical characteristics of sea buckthorn fruits from the analyzed varieties

Parameters	Clara	Mara	Cora
Fatty acid content (%)	4.67	3.37	1.76
Vitamin B1 (mg/kg)	0.36	0.28	< 0.10
Vitamin B2 (mg/kg)	5.00	1.23	0.96
Vitamin B3 (mg/kg)	3.51	2.30	2.10
Vitamin B5 (mg/kg)	3.68	3.70	6.37
Vitamin B6 (mg/kg)	0.94	0.58	0.84
Vitamin B7 (µg/kg)	47.8	26.3	37.8
Vitamin B9 (µg/kg)	248	239	266
Vitamin B12 (µg/kg)	3.8	<0.5	< 0.5
Vitamin K3 (mg/kg)	<0.30	<0.30	< 0.30
Vitamin K1 (µg/100g)	4,940	3,750	2,280
Vitamin C (mg/kg)	1,520	2,430	808
Vitamin E (mg/kg)	51.8	42.9	48.8

So, these quality features of the organic sea buckthorn fruits raises to the superlative their use as functional foods, as:

- fresh fruits (by quick freezing);
- by extraction (obtaining sea buckthorn juice by cold pressing, obtaining organic sea buckthorn oil and powder by CO2 extraction, for two hours for 40 kg of raw matter results in oil, about 3-6% of the raw material and powder).

• Regarding the blueberries, the abundance of harvested fruits is an opportunity to process them into nutritious, energizing juices- functional food, with a simple and accessible preparation technology. The fame of blueberry juices, the "panacea", also comes from their richness in vitamins (C, B6, E, A. K), minerals (Ca, Mg, Mn, Zn, cobalt and selenium), strong antioxidants, mirtiline. The special virtues of blueberries are felt in almost all human body systems, and the health benefits are multiple. It is important to know that these substances are preserved even in the case of dried fruits, as in our study.

The utilization of by-products resulting from obtaining natural blueberries juices is another stimulating element of economic efficiency. The range of products that can be obtained is as follows (Nicole Petculescu, 2016):

- pectic substances used in food industry;
- natural food colorings;
- pharmaceutical products with a trophic and tonic role, antioxidants, powder of blueberries ;
- fermentation products (wine or fruit vinegar) obtained from pressing residues, diluted with water and treated with the sugar required for fermentation;

In the specialized literature, the documentary study identified the following physic-chemical composition of fresh blueberries (Table 3) [**2-7].

Table 3. Physico-chemical features of blueberries identified in the specialized literature [2-7]**

Compound	**Value (%)**
Water	78.5 - 87.7
Sugars	4.1-8.8
Malic acid, citric acid, tartaric acid	1 - 3.6
Tannin	0.26 - 0.51
Protein substances	0.94 - 2.78
Cellulose	1.43 - 4.57
Mineral salts	0.3 - 0.8
Vitamin C	65 - 400

Table 4. Procent of organic substances of fresh blueberries (N. Petculescu – „Technology of fruits and vegetables processing", 2016)

Type	**Proteins (g %)**	**Lipids(g %)**	**Glucides (g%)**
Wild blueberries	0,7	0,6	6,0
Cultivated blueberries	0,8	0,6	8,3

Practically, the physico-chemical quality indices used in determining the quality of blueberries involved the determination of next parameter within our study:
- *humidity*
- *total acidity*
- *the sugar content*
- *raw ash.*

The refractometric method for *humidity* determination was based on measuring the refractive index of juice (obtained by cold pressing). Soluble dry matter, which is the most important part of total dry matter, contains nutritionally valuable components, such as simple carbohydrates, acids, vitamins and minerals, accumulated in the pulp of the fruit. Soluble dry matter reflects the nutritional value of the sample, and calculated *humidity* provides information on the water content of the sample. The analysis of the physico-chemical parameters of the dried blueberries sample was outsourced to the Laboratory of Physic-Chemical Analyses of the Institute of Food Bioresources (IBA) Bucharest, Romania (Fig. 8, Table 4).

Caracteristici *Characteristics*	U.M.	Metoda de analiză *Test method*	Rezultate *Results*	Data (perioda) *Test day (period)*
Valoare energetică	Kcal/100g	REG. UE 1169/2011	385	08.02.2024
Valoare energetică	kj/100g	REG. UE 1169/2011	1632	08.02.2024
Proteine	%	Metoda Kjeldahl	2,76	01.02.2024
Lipide	%	Extracție Soxhlet	0,33	25.01.2024
Glucide, din care:	%	REG. UE 1169/2011	89,91	08.02.2024
-zaharuri	%	Metoda Schoorl modif.	58,76	05.02.2024
Umiditate	%	Termobalanță (105°)	11,59	25.01.2024
Fibră brută	%	PS FC 08	5,56	30.01.2024
Cenușă	%	SR 8613-2:2009	0,97	25.01.2024

Figure 8. **Physico-chemical analysis bulletin of the product "Dehydrated Blueberries" sample (IBA Laboratory, Bucharest)**

Table 5. Physico-chemical parameters of dehydrated blueberries samples

Compound	**Value (%)**
Proteins	2.76
Lipids	0.33
Carbohydrates, of which:	8,991
- sugars	5,876
Humidity	11.59
Raw fiber (cellulose)	5.56
Mineral salts	0.3 - 0.8
Ash	0.97

CONCLUSION:

1. White sea buckthorn and blueberries, thanks to the balanced ratio between sugars and acidity, are ideal for consumption both fresh in the form of bio-stimulative concentrated juice or diluted with water. Due to their nutritional value and mineralizing effect, these fruits are recognized for their functional food value, providing health benefits due to their complex chemical composition.
2. White sea buckthorn and blueberries provide a positively influence on body functioning; they protect against the occurrence of diseases, prevent nutritional deficits and can helps the normal growth and development of children. Thus, obtaining fruits from organically certified buckthorn and blueberries raises to the superlative their use as functional foods.
3. The results confirm that for fruits, the quality is influenced by the variety, by the pedoclimatic conditions and the applied agrotechnics.
4. The pedoclimatic conditions in the experimental area are favorable for the culture of white sea buckthorn (Clara, Mara, Cora, Andros varieties).
5. The influence of technology applied to varieties with high productivity (Clara, Mara and Cora), demonstrates the quality of fruit production per variety and their organoleptic qualities.
6. In terms of productivity, among the varieties of white sea buckthorn, the Clara variety stood out, with 7471 kg of fruits/ha, then the Cora variety with 6322 kg of fruits/ha and the Mara variety (6136 kg of fruits/ha).
7. The methods of processing of organic white sea buckthorn through new technologies offer a wider range of products (sea buckthorn oil, sea buckthorn powder, sea buckthorn juice, frozen sea buckthorn).
8. Blueberries, fruits rich in antioxidants (flavonic derivatives, myrtilin), vitamins and minerals, are appreciated both for consumption as such, in fresh form, and for processing in various food products (true functional foods, due to the sanogenic effects of the active principles: hypoglycemic, diuretic and disinfectant of the urinary tube, antidiarrheal, antihemorrhagic).
9. Dehydrated blueberries (*Vaccinium myrtillus fructus*) retain many of the benefits and nutritional qualities of the fresh fruit, while still being rich in antioxidants, essential vitamins and minerals.

(although they contain less water and vitamin C than fresh blueberries, they remain a valuable source of nutrients).

10. Composition-properties correlation of functional food in dehydrated blueberries:
    - *antioxidants and nutrients*: they still contain powerful antioxidants, such as anthocyanins, which are responsible for their purple color and which provide numerous benefits for human health (they also retain significant levels of vitamin K, vitamin C and manganese, as well as other substances essential nutrients).
    - fiber and digestibility: they are rich in dietary fiber, which contributes to the maintenance of intestinal health and a healthy intestinal transit (although dehydration can sometimes concentrate fiber, it remains a good option to support healthy digestion).
    - *glycemic index and blood sugar regulation:*they generally have a lower glycemic index than fresh blueberries, so they can help keep blood sugar levels within healthy limits and can be an option for people trying to control their weight or manage diabetes.
    - *anti-inflammatory properties and protection against chronic diseases*: they contain bioactive compounds (such as pterostilbene, which has demonstrated anti-inflammatory properties and potential protection against chronic diseases, including gastrointestinal diseases).
11. Organically certified white sea buckthorn and blueberries crops meet requirement necessary for their optimal capitalization by reducing the specific consumption of raw materials in full processing. In this way, functional finished products such as food and food supplements are obtained with a low production input.
12. Obtaining fruits from organically certified buckthorn and blueberries raises to the superlative their use as functional foods.

REFERENCES

1. Haralamb M. At al. – „Cultivation of forest species", ed. III (1967), Agro-Silvica Publishing House, Bucharest, Romania;

2. Muște S., Mureșan C., - „Control of the quality of raw materials of plant origin" - Practical workbook, (2011) Academic Press, Cluj Napoca;

3. Pârvu C., - „Encyclopedia of plants", vol. 1, (2002-2005)- Technical Publishing House, Bucharest, Romania;

4. Nicole Petculescu – „Technology of fruits and vegetables processing", Students university book, (2016), CermaPrint Publishing House, Bucharest;

5. Nicole Petculescu - „ Capitalization of blueberries in natural juices" – presented within "The Abc of Beginner Farmer", Antena Satelor National Broadcast /Radio on Sept 2023;

6. Nicole Petculescu – „ Growing the bluweberries crop (*Vaccinium myrtillus*) - presented within "The Abc of Beginner Farmer", Antena Satelor National Broadcast /Radio on April 2024;

7. Stănescu v., Șofletea n., Popescu O., - „Woody forest flora of Romania", (1997), Ceres Publishing House, Bucharest;

8. Tănăsescu N., - „*Fruit trees cultivation for all*", (2005), Pitesti University Publishing House;

9. Gabriela Vlăsceanu, Nicole Petculescu - "Valorization of organic sea buckthorn crops - potential vector of agro-food development in rural areas", pages 495-504, in the volume Alexandri, C., Chițea, LF, Kruszlicika, M., Leonte, MJC, Munteanu , CC (coord.) (2023). The challenges of the European Green Deal on agriculture and rural areas, Romanian Academy Publishing House;

8.Vlăsceanu G.A, Popa C., Brumă I.S – „Study on the behavior of some autochthonous varieties of sea buckthorn in certain pedoclimatic conditions in order to certify ecological production, (2013), in the volume: *Durable and sustainable rural systems. Studies in agro-economics and rural anthropology,* coordinator Ioan Sebastian Brumă, Publisher Presa Universitară Clujeană, Cluj-Napoca.

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1. Societatea Progresul Silvic, Personalities who have been active in Romanian centenary forestry 1918-2018, (2018), Forestry and Hunting Review, year XXIII/ no. 42/2018, ISSN-L 1583-2112, Silvic Publishing House, publishers: "Progresul Silvic" Society; National Forestry Research and Development Institute "Marin Drăcea" - Brașov Resort, online version: ISSN 2284-7936,www.progresulsilvic.ro, https://progresulsilvic.ro/personalitati-care-au-activat-in-silvicultura-centenara-romaneasca-1918-2018

2. Health Benefits of Blueberries - https://www.webmd.com/diet/health-benefits-blueberries, Accessed 25.05.2024

3. 10 Proven Health Benefits of Blueberries - https://www.healthline.com/nutrition/10-proven-benefits-of-blueberries, Accessed 12.06.2024

4. The Health Benefits of Blueberries - https://health.clevelandclinic.org/benefits-of-blueberries/, Accessed 15.06.2024

5. Everything you need to know about blueberries - https://www.medicalnewstoday.com/articles/287710, Accessed 15.06.2024
6. Health Benefits of Blueberries - https://www.news-medical.net/health/Health-Benefits-of-Blueberries.aspx, Accessed 11.07.2024
7. Top 7 Health Benefits of Blueberries - https://draxe.com/nutrition/health-benefits-blueberries/, Accessed 11.07.2024