



Top 10 ORAC Berries 2008

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This is a report on the antioxidant capacity of berries. The term ORAC stands for [Oxygen Radical Absorbance Capacity](#) developed by the [US Department of Agriculture](#). ORAC is a test tube measurement of how common foods provide phytochemicals countering [oxidative stress](#) which *underlies most major diseases*.

[Click here](#) for the [2007 ORAC report from the Berry Doctor](#).

Today, we review continuing issues about the ORAC score.

Browse these 2007 reports from the Berry Doctor's Journal!

- [What the ORAC score means and how it might be used in the public](#)
- [Mysteries and weaknesses of ORAC and other laboratory tests of food antioxidant strength](#)



The current top 10 ORAC berries!

[Note: each berry has been evaluated by the Berry Doctor -- *click!*
on the red link to read an essay]

Berry	Botanical	ORAC units per 100 g	Phenolics mg per 100 g	Vitamin C mg per 100 g	Carotenoid content ranking 0 to 4
#10 Blackcurrant (northern Europe, Canada)	<i>Ribes nigrum</i>	7,960a	1330a	181	1‡
#9 Wild blueberry (Canada, USA)	<i>Vaccinium angustifolium</i>	9,300a	-	10	0
#8 Cranberry (USA, Canada)	<i>Vaccinium macrocarpon</i>	9,584a	718a	12	0
#7 Elderberry (Canada, USA)	<i>Sambucus nigra</i>	14,697a	1950a	25 or 60	1‡
#6 Muscadine grape (USA)	<i>Vitis rotundifolia</i>	15,000‡	-	-	1‡
#5 Black raspberry (USA)	<i>Rubus occidentalis</i>	16,000b	-	-	0‡
#4 Aronia (black chokeberry) (Europe, USA, Canada)	<i>Aronia melanocarpa</i>	16,062a	2010a,c	-	0‡

#3	<i>Lycium barbarum</i>	30,300b	1309	73	4c
Goji (wolfberry) (China)					
#2	<i>Hippophae rhamnoides</i>	70,000‡	-	695c	4c
Seabuckthorn (China, Russia, India)					
#1	<i>Euterpe oleracea</i>	102,700a,c	-	trace	2‡
Açaí (Brazil)					

- - data unavailable
- 0 to 4 are subjective ranks by the Berry Doctor
- ‡ estimated, analyses are preliminary or there have been no comprehensive reports
- source of analysis: a = USDA; b = Brunswick Labs
- c - highest known value among berries

Where is the blackberry (*Rubus ursinus*)?

Remember this report? click!

Blackberry was ranked # 1 in antioxidant strength using a different test tube measure of antioxidant capacity.

5 Thoughts for understanding the data

1. most ORAC data from "a" are in **USDA reports** (*click!*)
2. an approximation: a berry's deep **pigmentation** = high total phenolics = high ORAC = sour taste
3. in some berries, high **vitamin C** (ascorbic acid, a **phenolic** acid) means high ORAC and high antioxidant food value (e.g., seabuckthorn)
4. **combining phenolics with carotenoids** probably means high ORAC -- **goji and seabuckthorn are unique** by having high contents of both
5. a test has not been devised yet to measure antioxidant capacity *both* from phenolics and carotenoids in the same food (hence, the "guesstimate" about seabuckthorn's ORAC)

Deciphering the table: 4 variables affecting the scores we see

1. growing region + environmental stress + ultraviolet irradiation = *stress* for a plant like açai growing at the top of tall palms in constant heat at the equator
2. post-harvest handling, such as using **freeze-drying** to rapidly secure the nutrient and antioxidant qualities of the fruit. In the table above, only açai was analyzed in

- freeze-dried samples (in other words, its antioxidant qualities were better captured, and the other berries may have higher ORAC scores if prepared similarly)
3. the ORAC measure is a laboratory test still undergoing changes for how it is performed; not all these berries were analyzed by the same people, the same laboratory, the same test tube preparation, at the same time after harvest or in the same sample condition (raw vs. air dried vs. freeze-dried)
 4. it is *impossible to assure that each berry was at the same stage of ripening* when picked for harvest then ORAC analysis -- a berry produces its antioxidant phytochemicals according to need during growth and ripening



açai: its ORAC score is better captured by freeze-drying within hours of harvest. No other berry in the table was prepared by freeze-drying for the ORAC analysis, adding an important variable for accurately comparing ORAC scores.

3 Caveats for interpreting the top 10 ORAC berries

1. other methods exist for determining antioxidant capacity and would create a different ranking -- [see example here](#) (*click!*)
2. wide, uncontrolled differences exist in how different berries were picked, processed and analyzed to produce these data
3. poorly understood berries, like those below, may have higher antioxidant qualities

2 "Pretenders" claiming to be ORAC king

Internet and public media reports in 2007-8 have claimed other exotic berries to be equivalent or greater than açai in antioxidant strength

- **camu camu** (*Myrciaria dubia*), another Brazilian fruit, with one of the highest reported vitamin C contents (> 1000 mg per 100 g)
- **Indian gooseberry** (*Phyllanthus umblica*), also called "amla" or "amalaka".
- Standardized ORAC results and nutrient analyses for these two berries have not been published yet in scientific journals.

- A recent industry report described the Indian gooseberry as

1 Prediction for the future use of antioxidant ratings on foods

- eventually, there will be a standard simplified method for preparing freshly harvested foods for antioxidant analysis. This measure will become a "freshness rating" as well as an antioxidant rating that will be shown on food labels. Just by glancing at a label number or symbol, we will be able to recognize and select high antioxidant foods.

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