



## **New Research Confirms Hazelnuts Have More Antioxidants per Serving Than Many Other “Superfoods”**

### Hazelnut Proanthocyanidin (PAC) Content Highest Among Nuts

Hazelnuts have long been valued for their indulgent flavor and upscale appeal, but many people don't realize that they are also one of the most nutritious nuts and a powerful source of antioxidants. Hazelnuts are a good source of dietary fiber, vitamin E, magnesium and B vitamins. Hazelnuts can give meals an antioxidant boost while adding the indulgence, exotic appeal and satisfaction that consumers crave.

### **Antioxidants in Hazelnuts Promote Health**

Antioxidants in the blood stream basically mop up substances called free radicals, small reactive molecules that cause damage to the body. Scientists believe these free radicals may be triggers for serious diseases such as cancer and heart disease. They also may be related to cognitive deterioration that comes with aging. Antioxidants are found naturally in many foods such as vegetables, fruits, and nuts, including hazelnuts.

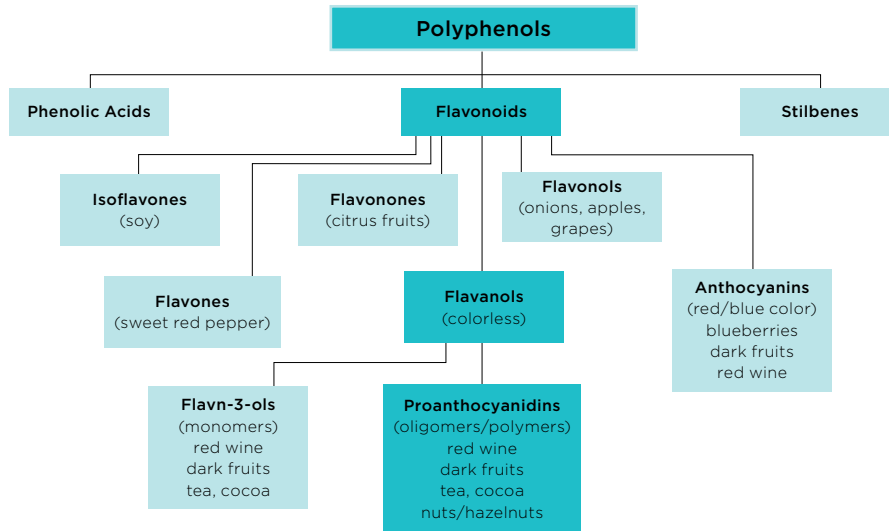
#### **Key Points**

- Hazelnuts contain powerful antioxidants that help support a healthy diet
- Hazelnuts have the same range of antioxidant activity as many other foods referred to as “superfoods”
- Hazelnuts have more PACs than any other nut, and amounts per serving similar to dark chocolate or Concord grape juice
- For the greatest PAC content, use natural hazelnuts with the skins intact, which contain three times more PACs than hazelnuts without skins



## Flavanols are a Subset of Polyphenols

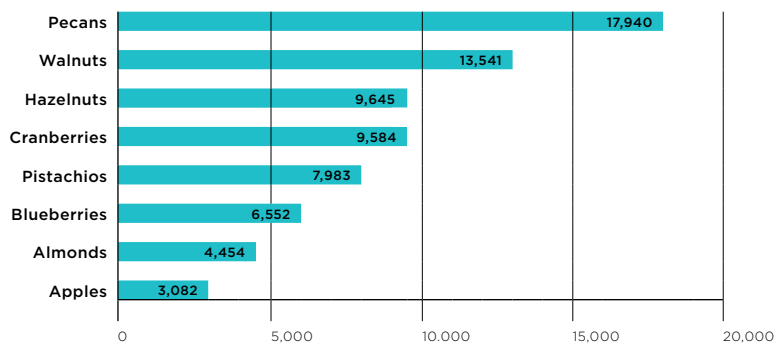
Thousands of plant-derived molecules have a polyphenol structure, and all of these compounds have antioxidant activity. Flavanols (see figure) appear to have beneficial non-antioxidant activity in addition to being antioxidants. Proanthocyanidins (PACs) are short chains of linked flavan-3-ol molecules. PACs are found in many dark fruits, tea, cocoa, grape seed extract, pine bark extract, and some nuts, such as hazelnuts.



## Hazelnut Among the Highest ORAC Scores

The most widely accepted method for measuring antioxidants is called ORAC (Oxygen Radical Absorbance Capacity), and is a test tube measure of the ability of compounds to quench free radicals or oxidants. ORAC measures the capacity of foods to destroy the free radicals that are generated during normal activities such as eating, breathing and exercising. Foods that have high ORAC scores are often referred to by the food industry as “superfoods.”

### Selected ORAC Values



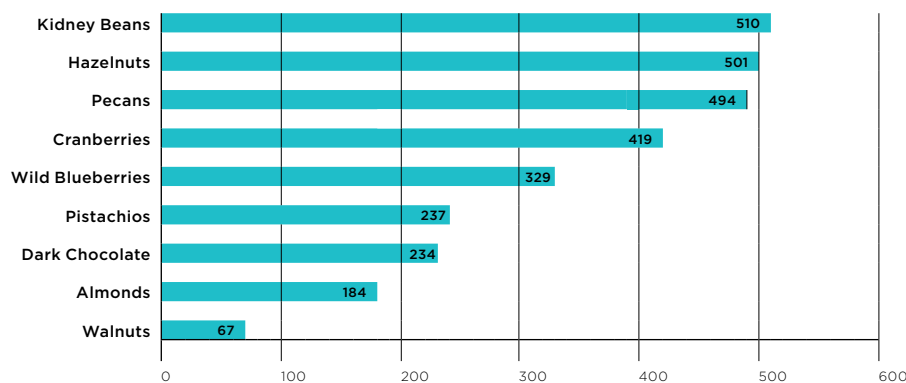
Hazelnuts have one of the highest ORAC values among superfoods. Within the category of nuts, hazelnuts score higher than almonds and pistachios, and only pecans and walnuts have higher ORAC scores. Values shown in the figure above are per 100 grams. For nuts, a serving is 28 to 40 grams (1.0 to 1.5 ounces). [Wu et al. *J Agric Food Chem* 2004;52:4026-37]

While ORAC scores are the currently accepted *in vitro* method for measuring antioxidant capacity, the scientific community acknowledges that some of these molecules are too large to be absorbed, while others may be metabolized so quickly as to not have any systemic antioxidant function. Research continues on how to best express antioxidant and other functions.

## Hazelnuts are High in Proanthocyanidins (PACs)

PACs are a subset of polyphenols that are recognized for giving foods (nuts, red wine, dark chocolate) an astringent mouth feel. Studies show that the antioxidant capabilities of PACs are 20 times more powerful than vitamin C and 50 times more potent than vitamin E. The antioxidant and other actions of PACs may help strengthen blood vessels, suppress platelet stickiness in arteries, reduce the risk of cardiovascular disease, lower blood pressure, and delay the onset of dementia. For a typical American diet estimated total polyphenol intake is approximately 1000 mg/day and PAC intake is less than 100 mg/day.

### Hazelnuts Among the Highest in PACs



The Hazelnut Council contracted with Brunswick Laboratories, Norton, MA, to measure proanthocyanidin content of four varieties of hazelnuts representing more than 95% of the nuts marketed in the United States. All varieties had a PAC content as high or higher than the average PAC content results published by Gu et al., (which did not report on the variety of hazelnuts tested).

Hazelnuts have one of the highest PAC contents among superfoods. Within the category of nuts, hazelnuts scored much higher than all but pecans. Values shown in the Figure are per 100 grams. For nuts a serving is 28 to 40 grams (1.0 to 1.5 ounces). [Gu et al. *J Nutr* 2004;134:613-17]

## Enjoy Hazelnuts with Skins to get the Most Benefit

New research conducted by Brunswick Labs for the Hazelnut Council suggests that food companies seeking to increase the antioxidant and PAC content in foods should consider using hazelnuts without removing the skins. Hazelnuts with skins intact had approximately 10 times the total phenol content and ORAC of nuts with skins removed (by either roasting or blanching), and approximately three times the proanthocyanidin content.