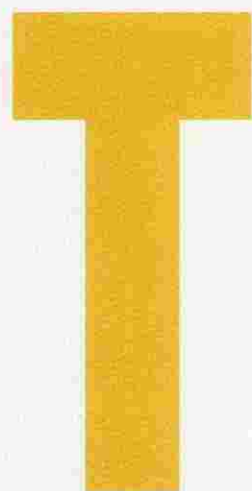


BEE POLLEN: Top Rank Antioxidant

New studies show bee pollen has the highest antioxidant activity of whole foods

by Lyle Hurd, editor



Slavic and Native American peoples. Beehive substances have been mentioned in virtually every religious text ever written including the Bible, the Torah, the Koran and the Scrolls of the Orient.

he substances of the beehive have held a revered place throughout history among the ancient cultures of Egypt, Greece, Rome, China, the Middle East and the

The production of pollen by a plant is an extraordinary, powerful step in the food chain. Primal forces of nature are harnessed inside the tiny pollen grain. Bees collect pollen from the flowers and mix it with their nectar, transforming it into a nutrient-dense, natural super food (a single granule of bee pollen contains 300,000 to 500,000 pollen grains). The bioactive ingredients found in bee pollen number in the thousands. These include enzymes, carotenoids, essential fatty acids, free amino acids, natural chelated minerals, whole vitamin complexes, lipids and trace elements, as well as phenols and polyphenols, which are significant contributors to antioxidants in the human body.

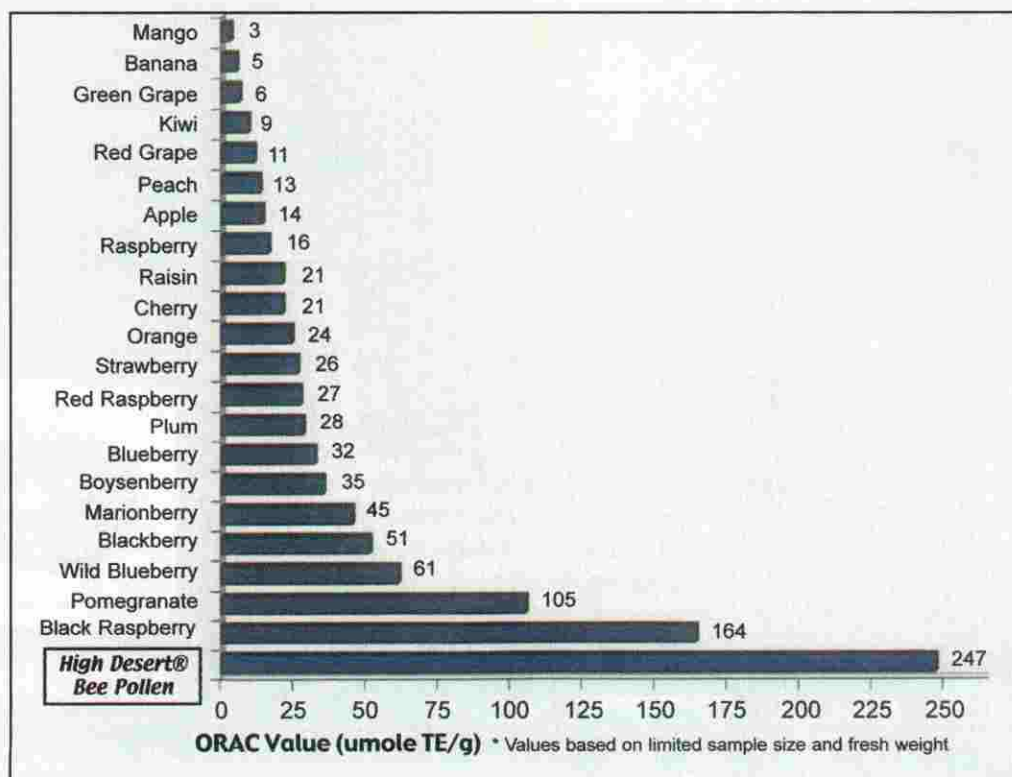
Even though beehive products have been used since ancient times as dietary supplements, in modern times the perception that beehive products promote health, due to their nutritionally beneficial compounds, has increasingly come under attack. This skepticism has been particularly due to the lack of scientific studies examining the issue.

However, today laboratory techniques have been developed that make it easier to study the beneficial effects and the nutritional make up of natural substances.

The Oxygen Radical Absorbance Capacity (ORAC) test is an emerging standard by which science measures antioxidant activity in foods and natural supplements.

Antioxidants are important to protect the body's cells from damage caused by free radicals (reactive oxygen species). Cell membranes are susceptible to free radicals because they are largely composed of fatty acids (lipid bilayer). Polyunsaturated fatty acids are particularly susceptible to free-radical-mediate oxidation because of their unique structure. Cell membrane damage due to oxidation of fatty acid membrane components (lipid peroxidation) can lead to the disruption of the function and structure of whole cells. Furthermore, for good health it is important to maintain normal levels of lipid peroxidation of lipoproteins.

Dietary antioxidants, or free radical-scavengers, may play a preventive role in protecting a person's health. High levels of antioxidant activity, as determined by ORAC, have been found



to be present in blueberries and black raspberries. When the ORAC scores of these berries became known, annual consumption of those fruits increased dramatically. Berries became famous as the foods possessing the most antioxidant activity of all the whole foods. The highest ORAC scores for wild blueberries is listed at 61 ORAC units (umole TE/g). Black raspberries scored higher at 164 ORAC units.

Recently High Desert Bee Pollen (a proprietary ingredient of the CC Pollen Company) was tested for ORAC by Brunswick Laboratories, a leading analytical services company specializing in antioxidant capacity measurement and antioxidant activity (see graph). According to Boxin Ou, principal research scientist at Brunswick, the result of 247 ORAC units is the highest score ever recorded for any whole food.

Brunswick Laboratories is currently conducting ongoing research to identify the individual properties of the components in the pollen which contribute to the potent antioxidant value of this particular product. Brunswick Laboratories is also conducting concurrent research on CC Pollen Bee Propolis.

Certain laboratories are now also measuring the polyphenol content of foods and supplements. Polyphenols, as a class of nutrients, include bioflavonoids, organic acids and phenolic acids. Most of the antioxidant activity of a food is created by polyphenols. Polyphenols have been extensively studied in regard to their antioxidant activity and health-promoting biological activities. Generally, total polyphenol content is regarded as a measure of the health-promoting qualities of a whole food.

When tested for total polyphenol content High Desert Bee Pollen also showed the highest polyphenol content of any of the foods tested.

In order to explore the practical implications of the findings of the High Desert Bee Pollen studies to health conscious consumers, we consulted some respected authorities in the field of nutritional sciences.

Alexander G. Schauss, Ph.D., is the director of Natural and Medicinal Products Research, Life Sciences Division and president of the American Institute for Biosocial and Medical Research, Inc., in Tacoma, Washington. Over the past 30 years of being involved in nutrition and botanical medicine Dr. Schauss has been recognized for numerous outstanding achievements in both the private and public sectors. Dr. Schauss is the author/coauthor of more than 125 papers and scientific works. His forthcoming book, with

coauthor Laura Frank, Ph.D., R.D., is about the treatment of obesity.

Dr. Schauss:

There has been a great deal of research done for many years on bee pollen, not only by individuals in the apiary community in the U.S. but all over the world. There are thousands of studies that have been published in numerous countries looking at the nutritional composition of bee pollen and bee propolis. The literature is very rich in this area. You can literally find them in the U.S.D.A. libraries throughout the U.S.

High Desert Bee Pollen measured what no other bee pollen research had done before. It looked at the ORAC value. And frankly I found it quite remarkable that the ORAC assay outcome was significantly higher than the fruits and vegetables included in the study. This is very promising quantifiable data that documents the actual antioxidant potential of the food. However, we should also stress that this research was conducted on the specific High Desert Bee Pollen formula perfected over 20 years of identifying which pollen strains deliver the highest nutritional values. Data cannot be projected to other processed bee pollens. There can be significant variations in composition in bee pollen and propolis products.

We also need to consider that the reality is that most consumers of food today are getting far less of the compounds and constituents found in fruits and vegetables which researchers believe play a vital role in the prevention of numerous diseases, especially those that are related to aging, such as cancer, coronary vascular disease and diabetes. As a result, we are looking at how we can provide them convenient vehicles for getting some of the constituents found in these foods, such as phenols and polyphenols, which are significant contributors to antioxidant activity in the human body, and delivering them in a manner that is efficacious, reasonable and affordable. I think this is where products like bee pollen and bee propolis can make a significant contribution, particularly from a weight and volume standpoint. If an individual either can't or won't consume the necessary quantities of food, the option of taking two tablets three times a day and receiving the same compounds and constituents they need to assist the body in maintaining optimum health is an important option.

C. Leigh Broadhurst, Ph.D., is a physical and analytical geochemist and an expert in the design and operation of chemical research lab-

oratories. She is a research scientist at the U.S. Department of Agricultural Research Service, Beltsville, Maryland. Her work in the field of polyunsaturated fat nutrition is fundamental to understanding the causes and natural cures for asthma.

Dr. Broadhurst is also president of 22nd Century Nutrition, a corporate/personal nutrition and scientific consulting company. Her books include *Health and Healing with Bee Products* (alive books, 2000) and *The Whole Family Guide to Natural Asthma Relief* (Avery, 2002).

Dr. Broadhurst:

Bee pollen preserves an element of nature which is virtually nonexistent in horticultural produce today. Many of the phytochemicals are bitter and not that pleasing to our palates. For instance, there are a number of beneficial flavonoids in citrus peel. The white pith of the orange delivers the highest antioxidant potential in the fruit. Citrus extract was one of the first bioflavonoids sold. However the current trend is to grow produce to be larger, sweeter and milder. In doing this we have bred down the concentration of phytochemicals. Consequently we have to look to supplementing with herbal products to bring them back to levels in the diets that evolved in our eating preferences.

Bee pollen bypasses these considerations. Pollen doesn't fall into the category of iceberg lettuce, oranges, orange juice, blueberries and strawberries. It provides phytochemicals that are in higher concentrations by far than any type of produce. No matter what it may be, you are not going to achieve the concentration and variety delivered in bee pollen. Bee pollen is comprised of the male reproductive spore of the plant. It is filled with components designed to grow it into a mature, healthy plant. Also the pollen needs to constantly evolve to conquer the increasing toxicity in its environment. Due to the vulnerability of the organism, these embryonic cells are highly concentrated in antioxidants, which can protect against losing the plant and a generation in nature.

There are obviously many reasons for consuming individual produce. I include bee pollen in the broad scope of produce. It is a quick, pleasant and easy to obtain serving of fruits and vegetables. It is derived from a broad spectrum of plants; one granule can provide up to half million pollen spores. Due to its complement of plant sex organs it is also very high in phytosterols; we are currently looking closely at the role of phytosterols and in low-

ering cholesterol and the risk of heart disease.

The ORAC testing, which confirms the antioxidant potential of high desert bee pollen, is a positive confirmation of bee pollen potential as a valuable nutrient for establishing and maintaining human health. Ongoing research into benefits of the compounds and components of bee pollen and bee propolis can only help us even better understand the science behind the wonders of bee pollen extolled by inhabitants of countless cultures over the past tens of thousands of years.

What's in Bee Pollen?

Bee pollen is packed with many different nutrients: amino acids, antibiotic factors, DNA/RNA, enzymes, glucosides, hormones, minerals, vitamins and other ingredients not determined yet.

Amino Acids/Protein. There are 22 amino acids in bee pollen, including all of the essential ones in highly concentrated amounts, making it an extremely usable and complete protein. Weight for weight it is higher in protein than steak, eggs or cheese, without large amounts of fat.

Antioxidants. Being rich in phytochemicals, including flavonoids, carotenes and phytosterols, bee pollen provides a host of important antioxidants including lycopene, selenium, quercetin and beta carotene.

Antibiotic Factors. Bee pollen has the capacity to regulate intestinal bacteria, thereby neutralizing toxic wastes and improving blood health.

DNA/RNA (or deoxyribonucleic acid and ribonucleic acid) carries the genetic coding of the plants from which the bees found it. It is found in pollen since pollen is the part of the plant responsible for reproduction.

Enzymes. Rich in enzymes, pollen therefore promotes improved metabolism and digestion. It contains 18 different enzymes including amylase, diastase, phosphatase, pepsin and trypsin. Enzymes are necessary for all bodily functions and because bee pollen is such a rich source, it greatly assists the body.

Glucosides are natural sugars that are involved in the creation of energy in the body. One main glucoside is rutin, which is important for its ability to help capillary walls resist infection, improve heart function and respiration, promote better healing and coagulation and control hypertension by regulating blood flow.

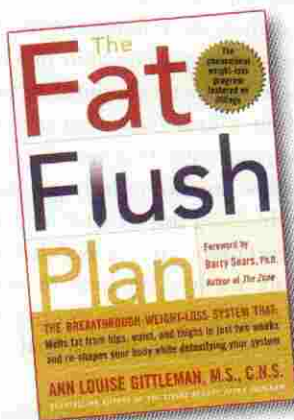
Hormones. Pollen contains plant hormones that activate and assist the body's own endocrine glands to allow them to function better. This is especially true for men since it can also lead to an increased sperm count.

Minerals. There are 27 different minerals in pollen including calcium, magnesium, iron and potassium as well as: boron, chlorine, copper, iodine, molybdenum, phosphorus, selenium, silicon, sodium, sulfur, titanium and zinc.

Vitamins. All known vitamins, from A to K, are found in concentrated amounts in bee pollen. They are provitamin A, B₁ (thiamin), B₂ (riboflavin), B₃ (niacin), B₅ (pantothenic acid), B₆ (group pyridoxine), B₉ (folic acid), B₁₂ (cyanocobalamin), biotin, choline, inositol, vitamins C, D, E, K and rutin.

Bee pollen even contains vitamin B₁₂, which is rarely found in plants or their products. It is essential for metabolism of fat, carbohydrates and protein, as well as blood cell and bone marrow formation and for healthy skin and nervous system. With all the other vitamins present, it therefore makes an excellent addition to the diet to ensure healthy functioning of all bodily processes. ❁

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