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# Nutrition

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# HOMIE GROWN!

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## Antioxidants *Move On*

By Janet Poveromo



**A**bundant evidence suggests that eating whole fruits, vegetables, and whole grains—all rich in networks of antioxidants and their helper molecules—provides protection against many of the scourges of aging, and consumers have bought into supplementing where their diets are lacking.

"The market of antioxidants is one of the oldest segments of the dietary supplements category," said Anurag Pande, PhD, vice president of scientific affairs with New Jersey-based Sabinsa. "As knowledge on oxidative stress emerged, antioxidants became part of our dietary regimen in the form of food, functional foods and supplements. While consumers don't know why, they are aware that antioxidants are good for them. With growing "green consumerism," consumers as well as formulators, researchers and marketing people are looking for antioxidants from natural sources, medicinal plants and traditional products consumed by people."

However, Bob Capelli, vice president of sales, marketing and materials management with Cyanotech in Hawaii, pointed out that antioxidants that only work as antioxidants have suffered recently due to some negative press. "Regardless if the research is flawed, consumers are less likely to commit to purchase an antioxidant when they read in the newspaper or hear on TV that antioxidants may not do anything for us. But antioxidants such as astaxanthin that are proven to benefit specific health concerns in human clinical research have been cruising along to unprecedented highs."

### Antioxidants to Watch

Anil Shrikhande, PhD, president of California-based Polyphenolics noted that polyphenols from grape seeds, tea, cocoa, wine, etc. continue to enjoy major market share of antioxidants. In nutraceuticals, blueberries, grapes, and other extracts are evolving.

There has been a pronounced shift away from the vitamin Es and Cs of yesteryear to cutting edge antioxidants that are proven to really do something for us in the here and now, added Capelli.

"One of the major antioxidant compounds which is catching the attention of people is pterostilbene," said Pande. "It is a trans stilbenoid phenolic compound, with chemical structure closely resembling resveratrol. It has increased bioavailability in comparison to other stilbene compounds which may contribute to health benefits people can derive from it."

Recent studies on pterostilbene have shown how its antioxidant activity can help modulate/inhibit carcinogenesis, neurological diseases, diabetes, cardiovascular diseases and host of other chronic diseases.

Another major product in this category is curcuminoids, added Pande. "Curcuminoids have emerged as a powerful antioxidant with versatile activity of anticarcinogenesis, anti-inflammatory, anti diabetic, healing, cardioprotective, neuroprotective, renal protective, with more benefits being iden-

tified every year."

"Curcumin," Pande continued, "is one of the strongest antioxidants, consumed by millions for its health benefits in various formulations." Sabinsa markets Curcumin C3 Complex, the most clinically researched brand of curcumin on the market. Composition of Curcumin C3 Complex is patented for free radical scavenging activity. Another benefit one gets from using Sabinsa's Curcumin C3 Complex is the added structure function claim of "BioProtection," an activity closely related to its antioxidant activity, he said.

"One of the key metabolites of curcumin, known as tetrahydrocurcumin, is gaining popularity in the dietary supplement industry for its higher bioavailability, higher bioactivity, stability and non-staining form, which is hugely important for GMP (good manufacturing practice) compliance."

"In minerals, selenium may be considered as the single most important mineral for antioxidant function of the body, being part of the structure of several intrinsic antioxidant enzymes in the body," Pande added. Selenium is a vital trace element with multiple roles in the growth and functioning of living cells of higher animals and humans.

Naturally found in soil, dietary sources of selenium include unrefined grains, fish and nuts. However, in parts of the world selenium is absent from the soil and in



# Nutraceuticals

others selenium in the soil is becoming increasingly depleted, so supplementation is important to replace what is missing from foods, he noted. "Selenium is a high-powered antioxidant that can effectively neutralize 'free radicals,' which may lead to severe cell damage. Small amounts of selenium have been found necessary for several biologic processes including immune response and thyroid function."

Selenium SeLECT® from Sabinsa is a single chemical entity containing molecularly integrated selenium. It is an organic compound and the predominant form of selenium found in naturally occurring food products.

In addition, India's superfruit, amla, trademarked Saberry® from Sabinsa, has powerful broad-spectrum antioxidant activity, and effectively quenches a variety of harmful free radicals, Pande noted. Saberry is a leader among water soluble phytonutrients in terms of broad spectrum antioxidant activity, showing a combined ORAC (oxygen radical absorption capacity) value of 358,600 mmol TE/100 g (ORACTotal + NORAC), HORAC of 34,500 mmol CAE/100 g, SOD capacity of 10,200 kunits SOD eq/100g and SOAC value of 135,100 mmol VitE/100 g.

## Consumer Usage

For antioxidant supplement users, prevention is key. "Consumers are trying to protect their health when they buy an antioxidant," said Capelli. "They're looking for a preventative health boost to keep them healthy and help them to live longer."

"Aging Baby Boomers have been educated on the harmful effects of oxidative stress and the importance of consuming antioxidants for slowing down the ageing process," Pande explained. "Younger people incorporate them into their sports nutrition regimen."

Antioxidants are available in various forms such as pills, capsules, liquid dietary supplements, beverages and functional foods."

Oxygen stress—that is formation of ROS (reactive oxygen species)—in daily life is a key mechanism followed by inflammation of cell obesity, Shrikhande noted. "These in turn are related to key symptoms such as pre-hypertension, hypertension, type II diabetes, cardiovascular dysfunction and also neurodegenerative diseases, which are all increasing at a very rapid rate due to imbalanced eating habits and sedentary lifestyles. Including antioxidants, such as MegaNatural brand grape seed extracts (GSEs), has shown to be beneficial to one's health."

## Health Studies

One of the most popular antioxidants in recent times has been curcumin, with Sabinsa's Curcumin C3 Complex the most clinically studied curcumin on the market, according to the company. "More than 65 scientific publications, including clinical trials, have been published using Curcumin C3 Complex," Pande said, adding that studies on Curcumin C3 Complex both *in-vitro* and in human clinical studies have shown that this unique natural compound can help to scavenge free radicals and reduce oxidative stress, among other benefits.

"With regard to amla," added Pande, "our studies reveal that its potential health benefits are not to be attributed to its ascorbic acid content, as commonly thought, but to gallic acid esters."

Natural amla is an antioxidant super fruit, pickled and preserved for its health food benefits and used in the ayurvedic tradition as a 'rasayana,' or tonic, in multiple compositions to support general health maintenance and the management of various disease conditions, Pande explained. Sabinsa's research data, published in 2009 in the *Journal of Agricultural and Food Chemistry*, revealed that the biological markers for amla are:  $\beta$ -Glucogallin and Mucic acid 1, 4 - lactone 5-O-Gallate.

"Although vitamin C is present in traces up to 3.5 percent in some varieties of amla, our studies show that in over 100 varieties the biological activity is due more to the  $\beta$ -Glucogallin/Mucic acid galates content than vitamin C," Pande said. "The clinical efficacy of amla cannot therefore be explained by vitamin C alone."

Polyphenolics' MegaNatural-BP has three human clinical studies completed with double-blind, placebo-controlled studies at University of California, Davis and Illinois Institute of Technology, Chicago, and a host of other papers have been published for mechanistic relationship, said Shrikhande. "The ORAC value of these GSE's roughly lies in the range of 13,500—14,000 mol per gram," he noted. "These special GSEs are also being incorporated in sports nutrition supplements because of their value in increasing nitric oxide formation, blood flow modulator and decreasing the antioxidative capacity of the blood. The values of these GSE's are unique in managing the healthy blood pressure and healthy blood glucose levels. A dose of approximately 300 mg/day is usually sufficient to modulate the above healthy state."

Capelli stressed that astaxanthin can benefit almost every major health concern



in the body. "We have long known about astaxanthin's effects on skin health, joint health and immunity, but recently there have been all kinds of new research showing astaxanthin supports other health concerns as well. Probably the most significant of these areas with the most research recently has been cardiovascular health."

## Antioxidant Supplement Trends

As knowledge on oxidative stress emerged, antioxidants consciously became part of our dietary regimen in the forms of food, functional foods and dietary supplements.

"Today known benefits of antioxidants are no longer limited to reducing the free radicals in the system but claims have encompassed the role of anti-aging, immunosupportive and anti-inflammatory neuro and cardioprotective function," said Pande.

Shrikhande pointed out that another trend in the supplement area is to provide different capsules in daily vitamin packs, which usually include an antioxidant. "Water containing nutrients and antioxidants is also a rapidly expanding business to differentiate from the traditional soda market," he added. "Providing an antioxidant in water also meets the criteria of hydration of the body. In nutraceuticals, this innovation can be seen as outside the box thinking."

An antioxidant has to be functional to get noticed by retailers and consumers, Capelli noted. "The market has become so flooded with antioxidants that they have to have at least one clinically validated property—to put it in other words, an antioxidant must be 'condition-specific' to get noticed."

Shrikhande concluded that prevention is an important concept rather than treatment. "The nutraceutical industry should capitalize on developing products heavily dependent upon science instead of psychology to promote the products." NIE

## FORMOREINFORMATION:

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