



ANTIOXIDANTS: FOUNTAIN OF YOUTH OR SIMPLY A FOUNTAIN OF RESEARCH?

Living a long life is something almost everyone thinks about, especially as one approaches middle-age, and there's no shortage of scientific research into the subject.

RESEARCH FOCUS

There are four main areas of research related to aging: damage to cells from normal, biological oxidative reactions (free radical damage that eventually wears out cells or causes them to do bad things); an inherited limit to the number of times our cells can divide before they die off (relative to the length of a structure on the end of our chromosomes called telomeres – the longer the telomere, the more times cells can divide, the longer the cells live); and lastly, chronic inflammation and a slow, steady hardening of tissues, both of which are probably normal to the aging process but may be especially susceptible to acceleration by certain dietary factors.

Chronic calorie restriction

Calorie restriction is an interesting possible approach to increased longevity and has drawn significant attention. Part of the theory is that eating less (30% fewer calories than normal) may reduce age-related inflammation, allowing flexibility of the cardiovascular system for a longer period of time. Additionally, consuming less food means producing fewer free radicals.

Maintaining a reduced calorie intake during one's lifespan may help stave off chronic inflammation-related disease such as osteoarthritis, diabetes and heart disease. But herein lies the problem, according to researchers, based on low calorie animal studies: you can't start this process at middle-age and expect any major results. Thus, this regime, besides being highly impractical, certainly would not be worth the effort in the long run for most humans. First of all, most people would never be able to restrict their calorie intake up to 30% less than usual for any length of time. Secondly, always depriving oneself would be a miserable existence. Thirdly, how do you tell a child he or she must remain hungry for the rest of his or her life in today's developed world? And finally, even if you could overcome all the obstacles of a life without food- or drink-related pleasures, it may only add an extra 2-3 years to your lifespan – not exactly the fountain of youth or holy grail of anti-aging. I, for one, would much rather enjoy life now and risk losing a couple years later on when life's probably not as much fun anyway.

WHERE DO ANTIOXIDANTS FIT IN?

Antioxidants & free radicals 101

Antioxidants are compounds that stabilize unstable chemicals called **radicals**. **Free radicals** are molecules that can attack cell components and irreversibly damage them while contributing to aging and disease.

By definition, free radicals are highly energized molecules that contain an unpaired electron and are produced through normal biological processes that involve oxygen. Every time you breathe and burn fuel in your cells for energy, you produce free radicals (FR). The natural production of free radicals can trigger chain reactions to produce more FR. Under normal circumstances, this type of FR production is held in check by antioxidants present in the body. However, additional contributors to FR production (such as modern environmental causes like pollution, sunlight, etc., as well as chronic exercise and aging) can and do shift the balance so that free radical production overwhelms our natural protection—hence the rationale for consuming additional antioxidant compounds.

The regular contenders for antioxidant research include vitamin C, vitamin E, beta-carotene, zinc, chromium, alpha-carotene, lutein, lycopene, zeaxanthin, CoQ-10 and alpha-lipoic acid. All these nutrients are the "action" components in the body's many different antioxidant systems. According to the theory, we may be able to minimize FR damage by getting the right amounts of all these and other important nutrients, thus slowing the development of age-related disease.

What's been disappointing in antioxidant research

Preliminary data suggesting that the regular consumption of high doses (400 IU or greater) of vitamin E (through its antioxidant actions) may help prevent cancer, cardiovascular (CV) disease, incidences of a second heart attack, and possibly stave off dementia, has recently been contradicted by a large, well-designed, long-term trial. The conclusion was that vitamin E supplementation of 600 IU daily had no overall benefit for the prevention of cancer or CV events. All that said, there may be other reasons to supplement vitamin E, including simply attaining the necessary amounts for normal good health (15 IU – an amount most adults do not acquire from food alone). Additionally, beta-carotene (pro-vitamin A) has also been a bit of a bust as it relates to preventative benefits for the general population.

What's been steady in research

Vitamin C, vitamin E, beta-carotene, zinc, chromium

These nutrients are all involved in FR protection and, as mentioned above, the more you exercise, eat, and the older you get, the greater the oxidative damage. Therefore, regular exercisers and athletes are often recommended to ingest more of these nutrients than their sedentary counterparts, which is why we recommend 2 to 3 (depending on body size) of our multivitamin and mineral formula per day for this population. At our suggested dose the recipient reaches levels that have demonstrated efficacy in reducing oxidative damage.



Alpha-carotene, lutein, lycopene, zeaxanthin, CoQ-10 & alpha-lipoic acid

For over 10 years these nutrients from food and supplements have demonstrated positive outcomes related to staving off age-related eye diseases (such as the formation of cataracts and macular degeneration--the major cause of loss of vision), and, because of their powerful antioxidant qualities, show great promise in reducing certain types of cancers. The Apex Super Antioxidant formula contains all of these nutrients and is recommended to all adults who are hedging their bets for longevity.

What's new with antioxidant research Resveratrol

Resveratrol, a compound found in red wine and grape skins, has demonstrated a wide range of positive biological activities including functioning as a potent antioxidant and scavenger of reactive oxygen species (free radicals).

Perhaps more interesting is the recent direct connection between resveratrol and aging. A gene known as Sir2 has recently been a topic of research related to aging. Increasing the number or activity of Sir2 genes in certain animals can extend their life span up to 50%. Resveratrol appears to activate the same enzyme that the Sir2 gene controls, and this may be how extremely high doses of resveratrol might extend one's life span. To be sure, a recent study showed that feeding resveratrol to fish extended their maximum life span by 59%. It is unclear if the chemical would have the same effects in humans. Additionally, the doses used in animal studies would be equivalent to hundreds of bottles of red wine or handfuls of pills daily. And I am not sure you could make it through the first bottle of wine so you could continue on to the 2nd, 3rd, 4th, etc., in order to get the proper daily dose – although it may be interesting to try. However, if a drug can be made to mimic the effects of high doses of resveratrol then we may have something. I say drug because the natural structure of resveratrol would have to be altered in order to increase its potency to the point that a practical dose could be attained (making the new form a man-made compound or drug).

It's possible that a realistic dose of the natural resveratrol may have health benefits with no down side, and we've been investigating this to see if we want to add it to our Super Antioxidant. In the meantime, a glass or two of wine and a handful of grapes daily with a serving of fish may be a nice addition to your diet – but watch your calories – don't add them, substitute them!

Green Tea

Green tea containing epigallocatechin gallate (EGCG) has been shown to have many health benefits including anti-carcinogenic, anti-angiogenic, antiviral and anti-diabetic activities as well as antioxidant qualities. The flavanoids (called catechins) contained in green tea are responsible for its purported antioxidant and carcinogenesis prevention properties. It appears that EGCG has the ability to inhibit angiogenesis and to impair cell cycle progression (both actions may help ward off cancer growth). EGCG has been shown to induce glutathione S-transferase and to decrease the production of

reactive oxygen species (or free radicals), which demonstrate the compound's antioxidant qualities. Additionally EGCG, at least in animal studies, has been shown to significantly decrease blood glucose, suggesting a potential role as an anti-diabetic agent. And finally, from last month's newsletter, there's the primary reason we use EGCG in our Fat Burn 3 formula: its ability to increase 24-hour energy expenditure and fat oxidation while potentially destroying fat cells (inducing apoptosis). All these potential benefits make green tea one of the hottest topics in the media and the scientific community. Although the latter group does not believe it's a magic bullet for reducing fat or for anti-aging, in proper doses EGCG may have greater overall health potential benefits than most other single natural compounds.

Jumping on the band wagon

Anything getting as much press coverage as green tea is going to end up with the "big-boys," and Coca-Cola has released a green tea product called Enviga. Basically, Enviga is a very low calorie (5-calories per 12oz can) combination of caffeine and the green tea extract EGCG. Sound familiar? We've had that mixture in our Fat Burn 3 for two years, and it's being used with great success because the dose in our product is appropriate. In order to get an effective dose from drinking Enviga you would have to consume three 12 oz bottles per day at a cost of between \$4 and \$6. Fat Burn 3 gives you all this and more for less than \$1 per day – and without the calories!

At the end of the day, Enviga is a good alternative to caloric beverages (such as regular sodas) that yield no nutrition. I wouldn't expect anymore from it than a diet soda, but hey, diet drinks are a far better choice than sugared beverages when you want something with flavor to quench your thirst or to satisfy an urge to ingest something when you really shouldn't.

DON'T FORGET YOUR FIBER – WE DIDN'T

Fiber isn't an antioxidant, but it does positively affect health and I had to insert a plug for our new fiber-containing Fitness Fast Food. And because most of us don't consume nearly enough fiber to reap all its health benefits, we present the new Apex **Fruit Fuel High Fiber Energy Bar** (now that's a mouthful – pun *intended*). Fruit Fuel bars come in Apple Pie and Blueberry Cobbler flavors and contain 6 grams of dietary fiber each (see side bar for a profile of the Apple Pie flavor). Remember, we're supposed to be shooting for 25-30 grams of fiber daily, but the average American gets less than 10. Add these to your pantry for lunches, desserts and snacks--they taste so good even kids will eat them!



FINAL COMMENTS ON AGING AND ANTIOXIDANTS

When it's all said and done, resistance to aging is primarily genetic and most likely all living things simply wear out because they must. Otherwise, the alternative would be scary—think about the cost of health insurance, or those people who've had a little too much cosmetic surgery. Now imagine if we all lived 59% longer (or another 47 years based on the average life expectancy). Fortunately, each of us has an inherent genetic time limit, which means that if we live to whatever our individual maximum age is (meaning we die of natural causes, which I guess is old age), some of us will die younger than others.

Whether it be the inherited length of our chromosomes' telomeres or the natural antioxidant protection our parents gave us, our life span potential is pre-set: maybe it's 80 (the average American life expectancy) or maybe it's 122 (the age of the oldest, currently living person). Getting to that number means taking care of yourself, and remaining functional until that number means REALLY taking care of yourself. And yes – you can live a long life without taking care of yourself, but that requires lots and lots of medical assistance and help from family, and there's no fun in that for anyone.

So let's hedge our bets

What we do know is that you may not live to your potential "time limit" if you don't control weight and get proper nutrition. And one thing for sure is that, if left unchecked, free radical damage can accelerate the aging process. Supplementing the "best you can do" diet with known antioxidant nutrients in proper doses is a viable means of helping us live to our pre-programmed potential with most of our faculties still in place. So, while researchers keep looking for that fountain of youth, don't forget your antioxidant, your fiber, and of course, your multivitamin.

--Neal

High Fiber Energy Bar

FRUITFUEL

We present the new Apex **Fruit Fuel High Fiber Energy Bar**. Fruit Fuel bars come in Apple Pie and Blueberry Cobbler flavors and contain 6 grams of dietary fiber each. Remember, we're supposed to be shooting for 25-30 grams of fiber daily, but the average American gets less than 10. Add these to your pantry for lunches, desserts and snacks--they taste so good even kids will eat them!

Nutrition Facts	
Serv Size:	1 Bar (55g)
Amount Per Serving	
Calories	200
Calories from Fat	20
% Daily Value*	
Total Fat 2g	3%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 240mg	10%
Potassium 65mg	2%
Total Carb 37g	12%
Dietary Fiber 6g	24%
Sugars 16g	
Sugar Alcohol 3g	
Protein 10g	20%
Vitamin A	10%
Vitamin C	20%
Calcium	10%
Iron	10%
Vitamin D	10%
Vitamin E	10%
Vitamin K	10%
Thiamin	10%
Riboflavin	10%
Niacin	10%
Vitamin B6	10%
Folate	10%
Vitamin B12	10%
Biotin	10%
Pantothenic Acid	10%
Iodine	10%
Magnesium	10%
Zinc	10%
Selenium	10%
Chromium	6%
Molybdenum	10%

* Percent Daily Values are based on a 2,000 calorie diet.