

ISAGENIXSCIENCE

Essentials of Youthful Aging

Isagenix is redefining what it means to age gracefully



Ageless Essentials with Product B is designed with a combination of vitamins, minerals, and bioactives to support a healthier, longer life.

The prevalence of obesity and undernutrition only continue to grow despite continued practical advice from nutritionists to eat less and make fruits and vegetables a greater part of our diets. Rampant overeating of the wrong foods characteristic of the average adult in the United States has not afforded increased intake of vitamins and minerals.

On the contrary, clinical and epidemiological studies find that most Americans receive suboptimal intakes of these micronutrients and that most suffer from either undernutrition or are likely to exhibit a moderate deficiency in at least one essential vitamin or mineral.

We are indeed a population that is overfed yet undernourished. Consider these facts:

- In 2009, less than 25 percent of U.S. adults consumed five or more fruit or vegetable servings per day (1).
- Most Americans receive only suboptimal levels of vitamins and minerals needed to protect long-term health.
- Recent evidence suggests that young adults may be deficient in B12 at much higher percentages than previously thought.
- Remarkably, vitamin E intake is inadequate in 93 percent of all U.S. adults.

Suk's Letter

It's no secret that the average American is overfed, yet undernourished. Despite the obesity epidemic, statistics continue to show most of the population is still not meeting requirements for a variety of vitamins and minerals. A good multivitamin helps support the body's basal metabolism and optimal health.

Now, as you'll discover in this issue, Ageless Essentials with Product B helps put us in better control of our health and aging through proper nutrition. When used as part of the Isagenix system, the AM and PM packets improve the health of every cell in our bodies, as well as the health of our hearts, our bones, and even our brains.

Live well and adventurously!

- Suk Cho, Ph.D.

- Almost all U.S. adults are extremely low in vitamin D.
- Even with dietary supplementation, many U.S. adults do not meet estimated average requirements for vitamins D, A, E, C, and the mineral calcium (see chart on Page 2) (2).

Experts agree that the incidence of "subclinical," or moderate nutritional deficiencies, have become far too common.

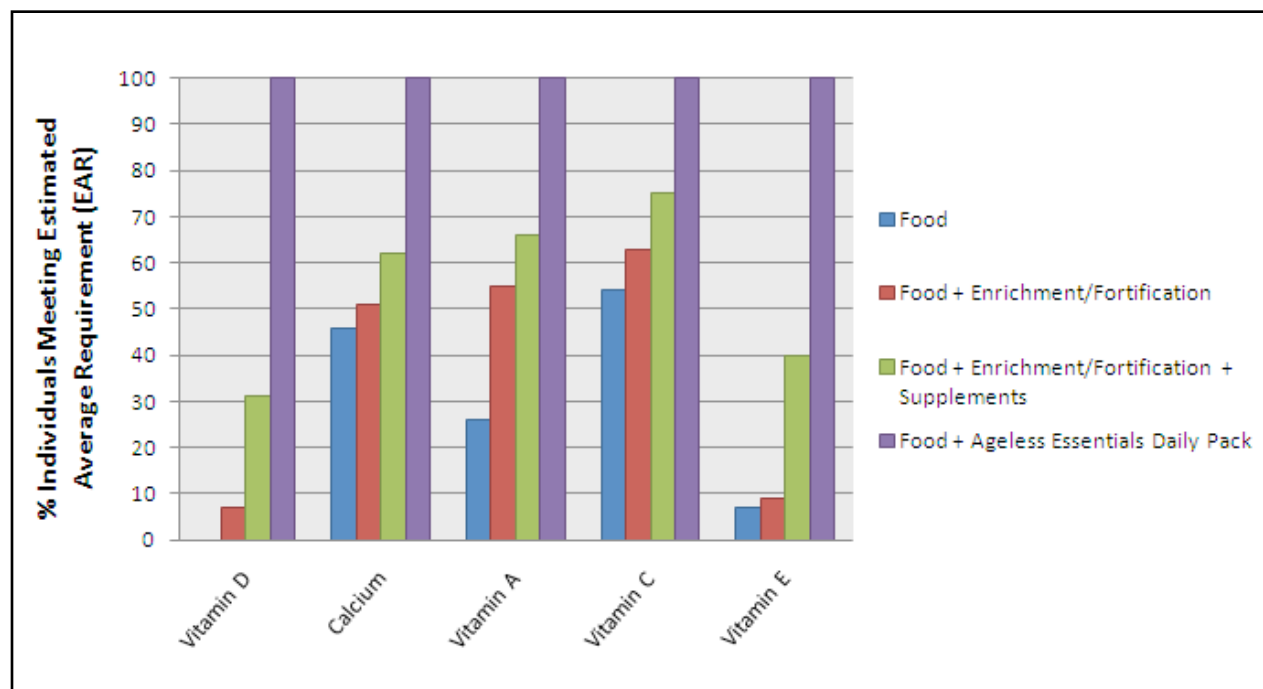


Figure 2. Comparing the percent of individuals meeting the estimated average requirement (EAR) of vitamin D, calcium, vitamin A, vitamin C, and vitamin E based on NHANES data and projected estimates by supplementing with Ageless Essentials Daily Pack.

These may cause metabolic and cellular harm over time. While nutrient intakes are high enough to prevent overt, classical symptoms of deficiency states, they are too low for our body’s optimal function (3). For example, vitamin C in the diet may be enough to prevent symptoms of scurvy, but not enough to maximize function as a coenzyme in skin health, or efficient quenching of free radicals, or in keeping the immune system vigilant. Other examples of subclinical or moderate insufficiencies have been described for magnesium, zinc, vitamin E, and vitamin C. Each of these nutrients is necessary to protect our cells and their components (including chromosomes and their telomeres - see Page 4).

Vitamins and minerals work in synergy to keep cells functioning efficiently and our physical structures intact. Even a subclinical deficiency of one can affect the others. Folate and B12, for example, are required as methyl donors for maintaining DNA stability, important for cell health, and metabolizing homocysteine, a cardiotoxic amino acid (4 & 5). Additionally, seven vitamins and minerals are required in the diet daily for just one of many steps in mitochondrial energy production. Finally, a low vitamin E status requires other antioxidants such as

vitamin C and selenium to take on greater responsibility in protecting our cells from free radicals.

Why take a multivitamin?

Do you spend time reading the nutrition facts panels of every food label and adding up vitamins and minerals to be sure you are meeting all dietary requirements? As the authors of a study published in the *Journal of Nutrition*, (1) summed up nicely, "nearly the entire U.S. population consumes a diet that is not on par with recommendations." It's a staggering conclusion.

If it weren't for the fortification of foods and dietary supplementation, another recent study just published in the same journal (2) found that many Americans would fail to meet even the minimum nutritional requirements set by the Institute of Medicine (IOM). Based on national surveys (NHANES) from 2003 to 2006, dietary supplements were responsible for improving the status of 17 micronutrients among more than 16,000 participants.

Multivitamins are the most commonly used dietary supplement and play a large role in ensuring adequate nutrient intake in the diets of a large portion of the population. Not only do multivitamins help people

meet their nutrient needs, but studies have also shown that taking them on a regular basis is associated with long-term health:

- Reduced risk of accelerated metabolic disruption, mitochondrial decay, and degenerative pathologies associated with aging (3)
- Improved maintenance of healthy concentrations of serum homocysteine, C-reactive protein, HDL cholesterol, triglycerides (4,5)
- Improved maintenance of healthy glucose metabolism (5,6)
- Improved cognitive performance, especially verbal memory, and mood (7)
- Improved calcium balance for cardiovascular and bone health (8-10) (see article on Page 6)
- Improved maintenance of chromosomal telomere length, a biomarker of aging (10)

"nearly the entire U.S. population consumes a diet that is not on par with recommendations"

Essentials for Men/Women


Taking control of your health is as easy as taking Ageless Essentials with Product B. Its component Essentials for Men/Women is designed to provide optimal doses of vitamins and minerals for healthy aging. To create the most advanced multivitamin supplement, Isagenix laid the groundwork for Essentials for Men/Women by performing a thorough review of the latest scientific studies. The focus was to ensure that the pack reflected quantities and quality of nutrients that meet criteria in line with updated nutritional guidelines, therapeutic doses and forms.

The tablets are designed with sustained-release technology by using forms of nutrients with different molecular weights, sizes, and solubility rates. They take into account the avoidance of anti-nutrient components such as phytates and reduction of mineral competitiveness. The separation into AM and PM packets also divides the doses over the course of the day for optimal absorption.

The combination of these elements creates a staggered release of nutrients into the small

intestine, providing steady passage and absorption of the various nutrients into the bloodstream.

References

1. Krebs-Smith et al. Americans do not meet federal dietary recommendations. *J Nutr* 2010; 140: 1832-8.
2. Fulgoni VL et al. Foods, Fortificants, and Supplements: Where Do Americans Get Their Nutrients? *J Nutr* 2011.
3. Ames BN. Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of micronutrients by triage. *PNAS* 2006;103(47):17589-17594.
4. Richards JB et al. Homocysteine levels and leukocyte telomere length. *Atherosclerosis* 2008; 200: 271-77. 5.
5. Block et al. Usage patterns, health, and nutritional status of long-term multiple dietary supplement users: a cross-sectional study. *Nutr J* 2007;6:30
6. Rautlainen et al. Multivitamin use and the risk of myocardial infarction: a population-based cohort of Swedish women. *Am J Clin Nutr* 2010.
7. Kesse-Guyot E, et al. Adherence to nutritional recommendations and subsequent cognitive performance: findings from the prospective Supplementation with Antioxidant Vitamins and Minerals 2 (SU.VI.MAX 2) study. *Am J Clin Nutr* 2011;93:200-10. doi: 10.3945/ajcn.110.007815
8. Latham et al. Effects of vitamin D supplementation on strength, physical performance and falls in older persons: a systematic review. *J Am Geriatr Soc.* 2003;51(9) 1219-26.
9. Oudshoorn C et al. Ageing and vitamin D deficiency: effects on calcium homeostasis and considerations for vitamin D supplementation. *Brit J Nutr* 2009;101:1597-1606.
10. Shea MK et al. Vitamin K supplementation and progression of coronary artery calcium in older men and women. *Am J Clin Nutr* 2009;89:1799-807.
11. Xu Q et al. Multivitamin use and telomere length in women. *Am J Clin Nutr* 2009;89:1857-63. 

SEVEN SUPPLEMENTS TO ENHANCE TELOMERE PROTECTION



With the recent surge of interest in telomere shortening as an underlying cause of aging, it's no wonder scientists are enthusiastically researching how diet and lifestyle influence telomere length.

Now, Ligi Paul, Ph.D., of the USDA Human Nutrition Research Center on Aging at Tufts University, has reviewed the latest literature associating telomere length with nutrients, bioactive compounds, and lifestyle factors (1). Interestingly, several of these nutrients are featured in Ageless Essentials with Product B.

Telomeres protect the ends of chromosomes from fusing with each other, Dr. Paul reminds us, and their length is an indicator of biological aging. Although shortening is a normal part of aging, oxidative stress can speed up the process.

“Of interest to nutritionists, telomere length has been shown to be associated with nutritional status in human and animal studies. Healthy lifestyles and diets are positively correlated with telomere length,” Dr. Paul wrote. And according to his review, the most recent studies (2-5) have found that the following nutrients may influence telomere length:

Vitamins and Minerals

- Folate – This B vitamin is important for DNA and RNA structure and function.
- Vitamin B12 – In conjunction with folate, this B vitamin is important for the methylation, or detoxification, of homocysteine.



Higher levels of homocysteine are associated with increased oxidative stress.

- Niacin (nicotinamide) – Can influence telomere length through its multiple regulatory and coenzymatic activities.
- Vitamin A and beta-carotene – These antioxidants reduce concentrations of harmful signaling molecules and increase beneficial ones to help reduce oxidative stress.
- Vitamin D – Higher levels of vitamin D are associated with reduced levels of c-reactive protein (CRP), a protein with harmful effects and associated with shortened telomere length. Vitamin D appears to inhibit some of CRP's harmful effects.
- Vitamins C and E – These antioxidant vitamins are widely acknowledged for limiting oxidative stress and its damage on DNA and telomeres.
- Magnesium – The mineral is required for the activity of a number of enzymes involved in DNA replication and repair. Low amounts of this mineral are also associated with higher concentrations of CRP.
- Zinc – This mineral is necessary for a variety of enzymes including DNA polymerases, which are important for DNA and telomere maintenance.
- Iron – In contrast to the above nutrients, iron supplementation is associated with shorter telomeres. This is likely because of iron's pro-oxidant ability to stimulate free radical generation. While iron supplements may increase oxidative stress, iron from diet or multivitamins (containing less iron) is not negatively associated with telomere length.

Other Bioactives

- Curcumin and turmeric – Turmeric, and its primary component curcumin, are common dietary spices that stimulate synthesis of antioxidants, thereby protecting against oxidative stress. Mice fed diets containing curcumin had a trend for longer telomeres compared with controls.
- Long-chain omega-3 fatty acids (fish oil) – Higher plasma levels of long-chain omega-3 fatty acids

docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) may protect against oxidative stress by enhancing activity of the antioxidant enzymes superoxide dismutase, catalase, and glutathione peroxidase (4).

- Polyphenols – Polyphenols from grape seed and green tea provide additional protection of DNA and telomeres from oxidative stress.

Those who drink tea regularly preserved increased telomere length (5) while mice fed grape seed maintained telomere length relative to controls.

Each of the mechanisms by which these nutrients and bioactives work may help explain why taking multivitamins is associated with longer telomere length. Those who take multivitamins, Dr. Paul notes, are also more likely to follow a healthy lifestyle.

For example, they are more likely to combine a diet high in fruits and vegetables with exercise, to not smoke, and to maintain a healthy weight—factors all associated with longer telomeres.

“Since diet and lifestyle can influence inflammation, oxidative stress and psychological stress, all of which cause telomere attrition [shortening], they could also influence telomere length,” Dr. Paul wrote.

The Isagenix system for managing a healthy weight, along with the Ageless Essentials with Product B, provides a solid foundation for maintaining telomere health. This combination of products contain high concentrations of all the telomere supporting nutrients and bioactives described by Dr. Paul and will help customers defy aging and preserve health and vitality.

With Ageless Essentials Daily Pack you can forget about the different supplement bottles and oversized

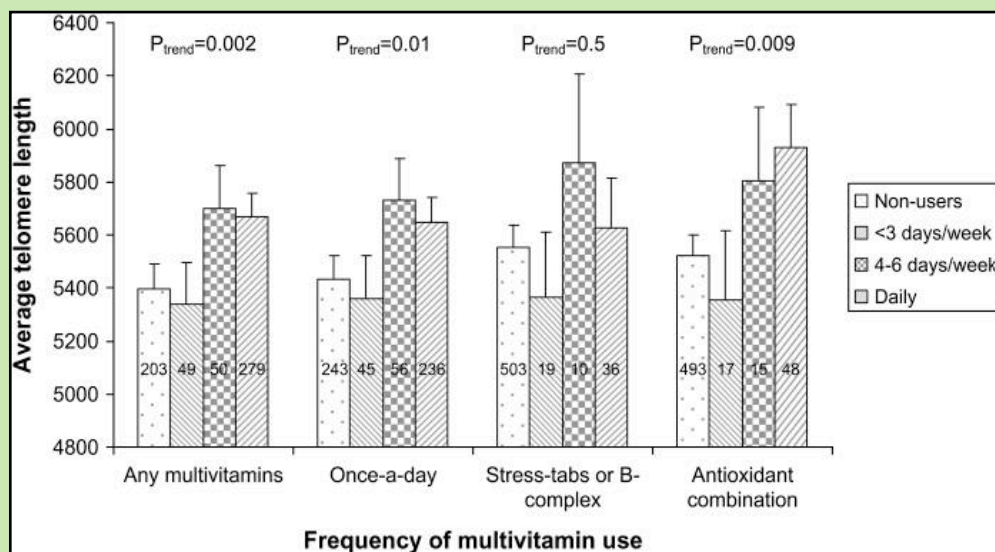


Figure 1. Multivitamin use and average telomere length in women. Ref: Xu et al. 2009.

pill boxes—you have all the necessary nutrients listed above in convenient, individually wrapped A.M. and P.M. daily packets.

Add Product B to the mix for enhanced telomere protection and greater stimulation of antioxidant enzyme defenses. The ingredients in Ageless Essentials with Product B are based on the latest scientific literature, offering the ultimate telomere protection from harmful free radicals and the effects of accelerated aging.

References

1. Paul L. Diet, nutrition and telomere length. *J Nutr Biochem*. 2011. doi: 10.1016/j.jnutbio.2010.12.01
2. Xu Q et al. Multivitamin use and telomere length in women. *Am J Clin Nutr* 2009;89:1857-63.
3. Cassidy A et al. Associations between diet, lifestyle factors, and telomere length in women. *Am J Clin Nutr* 2010;91:1273-80.
4. Lee JH et al. Omega-3 fatty acids for cardioprotection. *Mayo Clin Proc* 2008;83:324-332.
5. Chan R et al. Chinese tea consumption is associated with longer telomere length in elderly Chinese men. *Br J Nutr* 2010;103:107-13.



prospective, population-based study, scientists examined the relationship between dietary intake of vitamin K₁ and vitamin K₂ and its relationship to arterial calcification (6). The study found a strong inverse relationship between vitamin K₂ and arterial calcification, while vitamin K₁ was



not related to any specific outcome. These conclusions remained after adjusting for BMI, smoking, education, diabetes, alcohol intake, and dietary factors. Overall, the results suggest that high vitamin K₂ intake may be an important strategy for helping to preserve arteries elasticity.

The RDA for vitamin K is 120 µg/day and 90 µg/day for adult men and women, respectively. Good dietary sources of vitamin K₁ include green leafy vegetables (kale, spinach, collards, and lettuce) and some vegetable oils. In contrast, dietary sources of vitamin K₂ are mainly eggs, meat, and cheese. In fact, it is hypothesized that vitamin K₂ may account for the reduced arterial calcification in France and Mediterranean countries because of their high cheese consumption. Like other fat-soluble vitamins, a severe deficiency of vitamin K in westernized societies usually only

occurs in individuals with genetic malabsorption syndromes (with the one exception being individuals who are on anti-coagulants such as coumadin).



However, one study reported that only 17 percent and 27 percent of men and women in Ireland met the current RDA goals (5), while an evaluation of vitamin K intake in America suggested that the average intake was below the RDA.

Daily supplementation with vitamin K₂ offers a convenient way of obtaining the protective benefits of this critical nutrient. Ageless Essentials with Product B provides a total of 80 µg/day of vitamin K₂ and is divided into two doses, one taken in the morning and one in the evening. The product also combines the vitamin with other complementary nutrients for cardiovascular and bone health (calcium and vitamin


Vitamin K2 Benefits

- Regulates the balance of calcium within the body
- Helps maintain function of osteocalcin for clearing calcium from arteries
- Helps preserve arterial elasticity and flexibility
- Supports bone health
- Promotes a healthy heart

D). Along with proper diet and exercise, the combination represents a powerful strategy for supporting stronger bones while keeping arteries more flexible, elastic, and youthful.

After all, you're only as old as your arteries.

References

1. Shea MK et al. Vitamin K supplementation and progression of coronary artery calcium in older men and women. *Am J Clin Nutr* 2009;89:1799-807.
2. Price PA et al. Warfarin causes rapid calcification of the elastic lamellae in rat arteries and heart valves. *Arterioscler Thromb Vasc Biol* 1998;18:1400-7.
3. Booth SL. Roles for vitamin K beyond coagulation. *Annu Rev Nutr* 2009;29:89-110.
4. Booth SL, Pennington JA, Sadowski JA. Food sources and dietary intakes of vitamin K₁ (phylloquinone) in the American diet: data from the FDA Total Diet Study. *J Am Diet Assoc* 1996;96:149-54.
5. Duggan P et al. Phylloquinone (vitamin K₁) intakes and food sources in 18-64-year-old Irish adults. *Br J Nutr* 2004;92:151-8.
6. Geleijnse JM et al. Dietary Intake of Menaquinone is associated with a Reduced risk of coronary heart disease: The Rotterdam Study. *J Nutr* 2004;234:3100-05.
7. McCann JC, Ames BN. Vitamin K, an example of triage theory: is micronutrient inadequacy linked to diseases of aging? *Am J Clin Nutr* 2009;90:889-907. 

ANTIOXIDANTS FOR HEALTHIER ARTERIES

Among the several ingredients in Ageless Essentials with Product B are vitamin C, coenzyme Q10 (coQ10), vitamin E, and selenium. A recent study has found this combination confers strong cardiovascular benefits.



The randomized, controlled trial (1), published in *Nutrition and Metabolism*, compared the effects of daily supplementation of the combination over six months on participants who had at least two cardiovascular risk factors (hypertension, diabetes, high triglycerides, low HDL cholesterol, or smoking).

After six months, antioxidant supplementation showed significantly increased large and

small arterial elasticity compared to placebo. Arterial elasticity refers to how stiff or elastic arteries are. Supplementation also helped maintain healthy glucose and lipid metabolism, as well as blood pressure.

Previous studies have found vitamin C and coQ10 each deliver other benefits to the cardiovascular system and to myocardial function (2,3).

With complementary nutrients such as fish oil (omega-3s) and vitamin K2, Ageless Essentials Daily Pack represents a convenient strategy for better heart health.

Ageless Essentials Daily Pack features C-Lyte, which provides 520 mg of vitamin C as mineral ascorbates that are easier on the stomach. The pack also features Ageless Actives, providing 100 mg

ISAGENIXSCIENCE

Managing Editor

David Despain, M.S.
Senior Manager of Science Communications

Editorial Board

Suk Cho, Ph.D.
Chief Science Officer
Pierre Teissier, Ph.D.
VP of Global Product Development
Susie Rockway, Ph.D.
Director of Research and Science

Contributions and Copyediting

Eric Gumprich, Ph.D.
Sara Richter
Emily Lysyk

www.isagenixhealth.net

of coQ10 in a lipid-solubilized form developed by Bill Judy, Ph.D. The coQ10 is eight times (800 percent) more absorbable than typical dry powder forms.

References

1. Shargorodsky M et al. Effect of long-term treatment with antioxidants (vitamin C, vitamin E, coenzyme Q10 and selenium) on arterial compliance, humoral factors and inflammatory markers in patients with multiple cardiovascular risk factors. *Nutr Metab (Lond)* 2010;7:55.
2. Block G et al. Vitamin C in plasma is inversely related to blood pressure and change in blood pressure during the previous year in young Black and White women. *Nutr J* 2008;7:35
3. Judy WV, et al. Myocardial preservation by therapy with coenzyme Q10 during heart surgery. *Clin Investig* 1993;71(8 Suppl):S155-61.

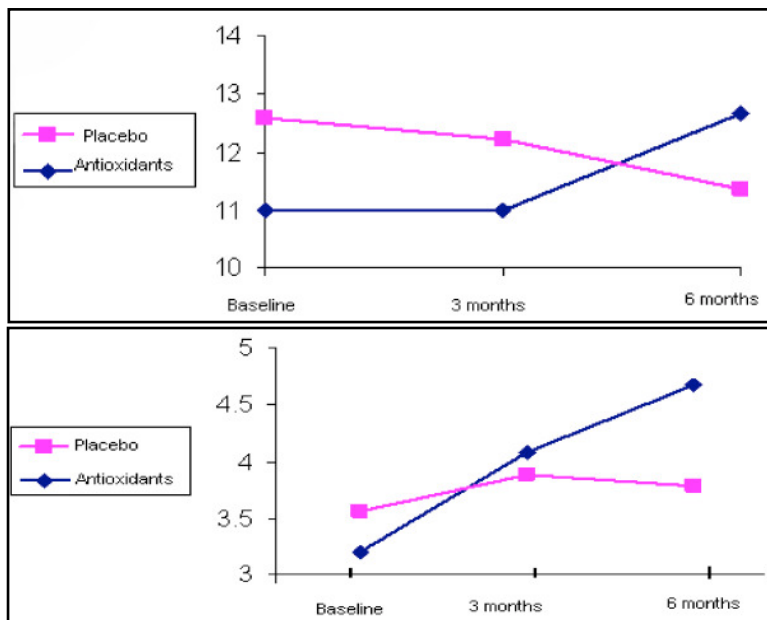


Figure 3. Effects of antioxidant supplementation on large (top) and small (bottom) arterial elasticity in participants with two or more cardiovascular risk factors.