

## **New RDAs for Vitamin C, Vitamin E and Selenium**

*Are you eating the recommended amounts of these powerhouse antioxidant vitamins and minerals each day?*

If you're like most Americans, you're probably interested in antioxidant-rich foods and supplements that "destroy free radicals" in hopes of optimizing your health and "slowing the aging process." New RDAs are out for Vitamin C, Vitamin E and Selenium.

Since 1941, the American population has become familiar with hearing about Recommended Dietary Allowances – or *RDAs* – for vitamins and minerals. Set by the Food and Nutrition Board (FNB) of the National Academies of Sciences, the RDAs have been established and adjusted over the decades based on current, growing knowledge from scientific studies evaluated by experts in the field. The RDAs reflect the types and amount of certain nutrients that are essential in a healthy diet.

Just last April, new RDAs were released for Vitamin C, Vitamin E and Selenium after an in-depth review of scientific evidence on these nutrients and also carotenoids. Through a major effort by the FNB in response to the increasing knowledge about the roles of vitamins, minerals and other nutrients in the diet, new Dietary Reference Intakes (*DRIs*) have been established for Vitamin C, Vitamin E, Selenium and carotenoids. DRIs are a new, more comprehensive system of nutrient recommendations that include: the Recommended Dietary Allowance (RDA), an estimated average requirement (EAR), adequate intake level (AI) and a tolerable upper limit (UL) for each nutrient.

Under the new system, the RDAs are still an important part of the larger DRIs. The new DRIs for Vitamin C, Vitamin E, Selenium and Carotenoids are the latest in a series of comprehensive reports on selected nutrients.

In the most recent report, researchers focused on these dietary antioxidants and the evidence in scientific studies to support maintaining or changing the current recommendations. Antioxidants are capable of helping to neutralize the damage created by the continuous formation of free-radicals in the body – otherwise known as oxidative damage.

### **Vitamin C**

Vitamin C is a powerful antioxidant and research has shown that it may play an important role in health conditions and diseases that result from oxidative damage. *The new RDA for Vitamin C is 75 milligrams per day for women and 90 milligrams per day for men.* This is an increase from the old RDA of 60 milligrams per day for male and female adults.

Evidence has shown that smokers undergo increased oxidative cell damage and require more Vitamin C. The recommendation is an additional 35 milligrams Vitamin C per day for smokers – a total of 110 milligrams for women and 125 milligrams for men.

An upper limit (UL) for Vitamin C has also been set at 2000 milligrams per day for adults since taking more can cause diarrhea in some people, and any amount above what is needed in the body is excreted.

The RDAs for Vitamin C can be easily met in the diet without supplements. Citrus fruits and green vegetables like broccoli, brussel sprouts and peppers are good sources of Vitamin C. A medium orange contains 75 milligrams of Vitamin C and ½ cup cooked broccoli has 58 milligrams. Consuming 5 fruits and vegetable servings each day according to the recommendations of the [USDA Food Guide Pyramid](#) [link to food guide pyramid graphic and brief article on pyramid] may provide over 200 milligrams per day.

## **Vitamin E**

Vitamin E is a fat-soluble vitamin and like Vitamin C, it is an important antioxidant. The main function of Vitamin E (alpha-tocopherol) is as an antioxidant that protects the cell membranes from oxidative damage by free radicals.

The RDA for Vitamin E is expressed in milligrams of alpha-tocopherol equivalents (TE) per day as labeled for foods, but supplements generally label Vitamin E in international units (IU). The previous RDA of 8 milligrams TE (or 12 IU) for women and 10 milligrams TE (15 IU) for men has been increased. *The new RDA for Vitamin E is 15 milligrams TE (22 IU) from foods or 33 IU in synthetic forms like some supplements.*

An upper level (UL) of 1000 milligrams TE (1,500 IU) has been set for Vitamin E since consuming greater than this amount increases the risk of bleeding. Vitamin E at high levels has anticoagulant properties. This UL could only be reached by taking Vitamin E supplements.

The average intake of Vitamin E in the U.S. diet is 7-10 mg for men and 7 mg for women daily, slightly lower than the RDA. Nuts, seeds, leafy green vegetables, and some vegetable oils are good sources of Vitamin E. One ounce of sunflower seeds has 14 mg, one tablespoon sunflower oil has 7 mg, one tablespoon of canola oil has 2.9 mg, and one avocado or one mango has 2.3 mg Vitamin E each. Fortified cereals vary in Vitamin E content from 3 to 30 mg.

## Selenium

Selenium is an essential trace mineral that also plays a role as a dietary antioxidant once it becomes part of certain enzymes that combat free radicals in the body. Selenium works with Vitamin E to protect against oxidative damage to the cells.

The previous RDA for Selenium established in 1989 was 70 micrograms for men and 55 micrograms for women. Based on extensive review, *the new RDA for Selenium is 55 micrograms per day for both men and women.*

The upper limit (UL) for Selenium has been set at 400 micrograms per day (from food or supplements) since higher than this amount can lead to toxicity. High doses above 400 micrograms on a regular basis can lead to *Selenosis*, a condition associated with dermatitis, loss of hair and diseased nails.

Since the typical American diet provides 70-100 micrograms per day, supplementation is typically unnecessary to meet the RDA. Seafood, meats, whole grains and some cheeses are good food sources of Selenium. Three ounces canned tuna provides 56-68 micrograms, one average, skinless chicken breast has 48 micrograms, one slice whole wheat bread contains 9.5 micrograms and 1 ½ ounces of cheddar cheese provides 6 micrograms of Selenium.

## Summary

The new RDAs for Vitamin C, Vitamin E and Selenium can be met in a diet that contains a variety of food items and is rich in fruits and vegetables. Upper levels (UL) are set so that Americans can be familiar with possible adverse consequences of too much of a nutrient. More is not always better. Intake above the RDA, while it may not be harmful if it is below the UL, has not been shown to provide additional benefits. Excess nutrients above what the body can use are generally excreted.

The new system of DRIs, which continues to include RDAs for each nutrient, is established to help Americans become more familiar with recommended intake levels as well as risks associated with excessive intake. Please click here to learn more information about the new Dietary References Intakes (DRI) project.

### References:

Internet site: <http://www4.nationalacademics.org/IOM/IOMHome.nsf>. Accessed September 2000.

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Shils, M.E., Olson, J.A., Shike, M., Ross, A.C., eds. *Modern Nutrition in Health and Disease*. 9<sup>th</sup> edition. Baltimore: Williams & Wilkins, 1999.