

HALE *Vitamins*

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Our March 2008 Newsletter for Healthy Living

Beautiful skin on the outside

Broccoli-sprout extract on the skin reduced sunburn and increased natural anti-cancer activity in skin cells, and vitamin A on the skin reduced wrinkles, in four new studies.

In a broccoli-extract study, doctors noted the recent increase in skin cancer due to an aging population getting more sunlight. Researchers recruited three men and three women, aged 28 to 53, and applied broccoli-sprout extract to half-inch patches of skin for three days, then exposed treated and untreated skin to intensifying pulses of ultraviolet (UV) radiation. On average, compared to untreated skin, the broccoli-extract-treated skin was 37.7% less likely to redden from burning rays (UVB). Doctors noted the **broccoli-sprout extract contained sulforaphane, which protected the skin by activating several natural anti-cancer**

enzymes in skin cells—even long after treatment—instead of absorbing UVB, as does sunscreen.

In a related study, researchers measured anti-cancer enzyme activity in skin cells and then applied broccoli-sprout extract in a dose of 150 nanomols per-centimeter-of-skin (nmol/cm) each day for three days.



As the number of doses increased, so did anti-cancer enzyme activity in skin cells; from 1.5 times after one dose to 4.5 times after three doses. Doctors noted that these results provide direct evidence

that sulforaphane activates the natural anti-cancer enzyme response in human skin. Separately, researchers tested broccoli-sprout extract in doses as high as 340 nmol/cm and found no side effects.

In a vitamin A study, researchers recruited 36 older adults, average age 87, and applied a 0.4% vitamin A (**retinol**) lotion, or a lotion placebo, to the left or right arm, up to three times per week for 24 weeks and found that **skin treated with retinol had significantly fewer fine wrinkles** compared to untreated skin. Doctors believe that wrinkles decreased because **retinol stimulated water-retaining molecules in the skin and activated collagen—the protein fiber that makes skin strong**—leaving skin thicker, less fragile, and less prone to injury, infection, and ulceration.

Reference: *Proceedings of the National Academy of Sciences*: October 23, 2007.

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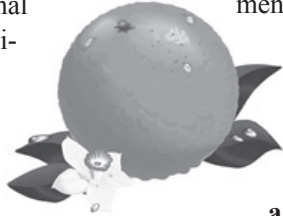
News & Research This Issue

- Broccoli-sprout extract and vitamin A improved skin health.
- Pycnogenol, menopause and erectile dysfunction.
- Vitamins C and K and linoleic acid made skin look younger.
- Mulberry lowered blood sugar and insulin.
- Dietary ingredients strengthened muscles and reduced fat.
- Folic acid reduced blood levels of arsenic.
- Calcium and vitamin D helped prevent osteoporosis.

Beautiful skin from within

Those with higher levels of vitamin C, vitamin K, and linoleic acid had healthier, younger-looking skin than did those with lower levels, two new studies reveal.

In a study of aging skin, researchers reviewed the diets of 4,025 women, aged 40 to 74, who had taken part in the National Health and Nutrition Examination Survey (NHANES). Dermatologists examined the women to determine how wrinkled, dry, or thin the skin appeared as a result of aging. Comparing the nutrients in the diet to the condition of the skin, scientists found that **women who had consumed higher levels of vitamin C were less likely to have wrinkled or dry skin** compared to those who had consumed



lower levels of vitamin C. **Women who had consumed higher levels of linoleic acid were less likely to have dry or thin skin** than were women who had consumed lower levels of linoleic acid.

Doctors noted that these results did not depend on age, race, education, sunlight exposure, income, menopause status, weight (body mass), exercise, or calories in the diet. However, **women who had consumed higher levels of fats and carbohydrates were more likely to have wrinkled or thin skin** compared to those who consumed lower levels of fats and carbohydrates.

In a study of **elastin—the protein that gives skin its ability to stretch and return to normal**—re-

searchers compared healthy people to those who had **calcium deposits** in the elastin, a condition known as pseudoxanthoma elasticum or **PXE**, where the skin does not stretch. Scientists measured levels of a naturally occurring protein, called **Matrix Gla** or **MGP**, which **curbs calcium deposits, but requires vitamin K to become active**. Although both healthy and PXE participants had similar total MGP levels—both active and inactive forms—skin cells from healthy participants produced 42.5% more active MGP than did skin cells from PXE participants. Doctors believe that those with PXE do not absorb vitamin K properly, and cautioned that **the Western diet does not provide enough vitamin K even for healthy people**.

Reference: *American Journal of Clinical Nutrition*: October, 2007; Vol. 86, No. 4, 1225-31.

Staying strong

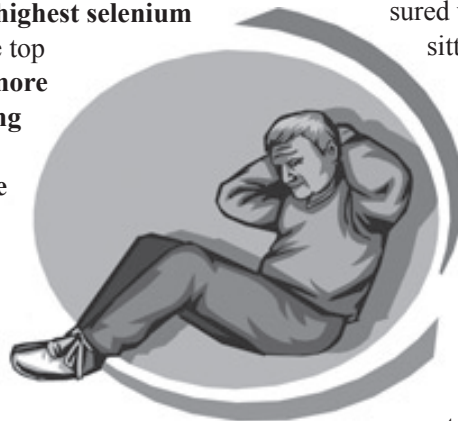
Seniors with higher **selenium** levels had stronger muscles than those with lower levels, and older adults who took **creatine** and **linoleic acid** along with exercise had stronger, leaner muscles and less fat compared to placebo, in two new studies.

In the selenium study, doctors noted that **muscles need selenium to function properly, but that there are no studies on how selenium affects muscle strength**. Researchers examined 891 men and women aged 65 or older who had taken part in the “Chianti” community-based study in Tuscany, Italy. Scientists measured blood-plasma levels of selenium and found that on average, **selenium levels were 24% below the minimum doctors believe is necessary** to produce enough selenoproteins, the antioxidant enzymes

that keep muscles healthy. Researchers also measured hip flex strength, hand grip strength, and knee extension strength, and found that **participants with the highest selenium levels—those in the top 25%—were 41% more likely to have strong hips, and 48% more likely to have strong hand grip and knee extension** compared to participants with the lowest selenium levels, those in the bottom 25%.

In the **creatine/linoleic acid** study, researchers recruited 19 men and 20 women, aged 65 or older, who had supervised resistance exercise training twice per week for

six months while taking 5 grams of **creatine monohydrate** plus 6 grams of **conjugated linoleic acid (CLA)** per day, or a placebo. Scientists measured walking, balance, sitting, standing, and stair climbing and found that both groups improved, but that the **creatine/CLA group had greater muscle endurance, stronger knee extensions, more lean-muscle (fat-free) mass, and had lost more fat** than the placebo group, without side effects.



Reference: *Public Library of Science Hub for Clinical Trials*: October, 2007; Vol. 2, No. 10, 991.

Better bones

Older adults who took calcium and vitamin D had fewer bone fractures and stronger bones, in two new studies.

Researchers identified 29 clinical trials worldwide that examined bone fracture and/or bone mineral density (BMD) in men and women aged 50 or older, who took calcium alone or with vitamin D. In 17 bone-fracture studies, involving 52,625 participants, overall compared to placebo, those who took calcium alone or with vitamin D had 12% fewer bone fractures of all types. **Those who took calcium alone or with vitamin D most consistently—80% of the time—had 24% fewer fractures of all types compared to placebo.**

In 23 studies that reported

BMD, involving 41,419 participants, overall compared to placebo, those who took calcium alone or with vitamin D had 0.54% less bone loss at the hip and 1.19% less bone loss in the spine. Lead researcher, Dr. Benjamin Tang stated, **“The results showed the importance of starting supplements early in life, at around the age of 50, when bone mineral loss begins to accelerate.”** The researchers recommend minimum doses of 1,200 mg of calcium and 800 IU of vitamin D per day for the best therapeutic effect. Doctors also believe that dividing the doses in half and taking twice per day enhances the effect.

In another calcium and vitamin D study, researchers

analyzed the amount of dairy, fish, nutritional supplements, and sunlight for 36,209 postmenopausal Caucasian women, from childhood through current day, and measured BMD at the forearm, finger, or heel. Compared to those with lower levels, **those with higher lifetime levels of calcium were 20% less likely to have osteoporosis, and those taking higher current levels of calcium were 25% less likely to have osteoporosis.** Those currently taking higher levels of vitamin D were 27% less likely to have osteoporosis than those with lower levels. Calcium and vitamin D did not affect fracture risk.

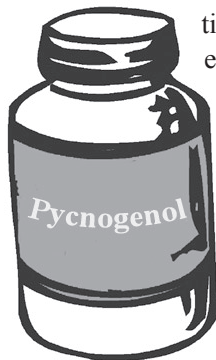


Reference: *Lancet*: August, 2007; Vol. 370, No. 9588, 675-66.

Reproductive health

Pycnogenol, a natural plant extract from French maritime pine bark, and L-arginine, restored sexual function in men, and pycnogenol reduced menopause symptoms in women, in three new studies.

In the first of two pycnogenol/L-arginine studies, researchers recruited 40 men, aged 25 to 45, whose erectile problems were not the result of a physical disease. For the first month, participants took 1.7 grams of L-arginine per day, with 5% reporting normal erections after 30 days, a result doctors said was not statistically significant. For the second month, participants added 40 mg of pycnogenol, twice per day,



and continued the L-arginine, with 80% reporting normal erections after 60 days. For the third month, participants took 40 mg of pycno-

genol three times per day along with the 1.7 gram L-arginine dose, with 92.5% reporting normal erections after 90 days, without side effects.

In the second pycnogenol/L-arginine study, 50 men with mild to moderate erectile dysfunction took a combination of L-arginine plus pycnogenol, or a placebo, for 30 days. After one month, all participants reported normal erectile function, and having sexual intercourse twice as often as at the start

of the study. In order to achieve an erection, the smooth penile muscle must relax. Doctors noted that levels of **nitric oxide**—which relaxes

“Pycnogenol improved physical function in men.”

muscle—in the sperm, and testosterone blood levels, increased. There were no reported side effects.

In a **menopause** study, 155 perimenopausal women took 200 mg of **pycnogenol** per day, or a placebo, for six months. At the end of the study, **all participants reported physical and emotional symptoms had improved.** Doctors noted the ratio of bad cholesterol to good cholesterol (LDL/HDL) improved, without side effects.

Reference: *International Journal of Impotence Research*: August, 2007.

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Here we go ‘round the mulberry bush—after dinner!

Mulberry leaf extract powder lowered blood sugar and insulin after a meal in a new study. Doctors theorized that the active ingredient in mulberry leaves (L-deoxynojirimycin or DNJ) could lower abnormally high blood sugar (glucose) levels and help prevent diabetes mellitus. Scientists first determined which parts of the mulberry plant, which planting locale, and which harvest season produced the most potent DNJ. Researchers then recruited healthy volunteers who took 6 mg, 12 mg, or 18 mg of DNJ, or a placebo, followed by 50 grams of sugar. After waiting 30 to 180 minutes, doctors measured blood-plasma levels of glucose and insulin and found that the **12 mg and 18 mg doses of DNJ significantly reduced after-meal glucose and insulin**, concluding that DNJ can be effective in preventing diabetes mellitus.



Reference: *Journal of Agricultural and Food Chemistry*: July, 2007; Vol. 55, No. 14, 5869-74.

This Month's HEALTHY Tip

Arsenic pollutes groundwater in 70 countries worldwide, including the U.S., Canada, and Mexico. The **B-vitamin folic acid reduced blood levels of arsenic** in 130 Bangladeshi adults who had high arsenic blood levels and low blood-plasma levels of **folate**, the food form of folic acid. Researchers measured blood levels of arsenic before and after a 12-week period when participants took **400 mcg of folic acid per day**, or a placebo, and found that those who had taken folic acid had 22.24% lower blood levels of a certain type of arsenic (monomethylarsonic or MMA) compared to 1.24% less for placebo. MMA tends to stay in the bloodstream, but **folate binds with MMA, permitting the body to excrete the arsenic through the urine**. Compared to placebo, those who took folic acid also excreted more of a second type of arsenic, called dimethylarsenic or DMA. Overall, the folic acid group had 13.26% less total arsenic in the blood compared to 2.49% less for placebo.

Reference: *American Journal of Clinical Nutrition*: October, 2007; Vol. 86, No. 4, 1202-9.

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