

## **Integrative Medicine Newsletter**

- **Cloudy Apple Juice for Health**
- **Caffeine for Exercise Pains**
- **2007 CAM Conference by Health Forum**
- **Selenium Supplements for HIV**
- **Tomatoes and Broccoli for Prostate Cancer**
- **2007 Women's Healthcare Forum**
- **Iron Deficiencies in Infants**
- **Acupuncture for Knee Pain**
- **Red Meat, Heart Disease and Diabetes**
- **Inside Natural Standard**

### **Cloudy Apple Juice for Health**

Cloudy apple juice may be richer in nutrients than clear apple juice, a new study reports.

Researchers from the Agricultural University of Wroclaw and the Medical University of Warsaw found that the polyphenol content of cloudy apple juice is four times greater than clear juice. Polyphenols have antioxidant activity and contain flavonoids thought to have disease fighting properties.

In the study, clear and cloudy apple juices from Idared and Champion varieties were studied for their radical-scavenging effects. The polyphenolic content and composition of the juices before and after thiolysis were determined by high-performance liquid chromatography with diode array detection. Thiolysis is a reaction with a thiol (R-SH) that cleaves one compound into two. This reaction is similar to hydrolysis, which involves water instead of a thiol. This reaction is seen in  $\alpha$ -oxidation of fatty acids.

It was found that cloudy juices, especially those prepared from Champion variety, had a higher content of procyanidins (a flavonoid) than clear juices.

According to the report, the production of clear apple juice involves the addition of enzymes to remove the pectin and starch content of the cloudy juice. Researchers suggested that this process may also affect the polyphenol content of the resulting juice.

The study reported that clear juice made from the Idared apple variety contained 250 milligrams of polyphenols per liter, while cloudy juice made from the Champion apple variety contained 1,044 milligrams per liter.

The radical-scavenging activity of the juices was measured with electron paramagnetic resonance (EPR) spectroscopy using the DPPH (1,1-diphenyl-2-picrylhydrazyl) radical, with the cloudy Champion apple variety juice reported to scavenge 93 percent of the

radicals after three minutes, compared to only 24 percent for the clear Idared variety juice.

The study concluded that apple juices, especially cloudy ones, are a rich source of natural antioxidants that may be used in the pharmaceutical or food industry.

Reference: 1) Oszmianski J, Wolniak M, Wojdylo A, Wawer I. Comparative study of polyphenolic content and antiradical activity of cloudy and clear apple juices. *Journal of the Science of Food and Agriculture*. Published Online: 15 Jan 2007. [View Abstract](#).

## **Caffeine for Exercise Pains**

Having a caffeine supplement an hour before exercise may reduce muscle pain post-workout, a new study suggests.

Researchers at the University of Georgia conducted a double-blind, placebo-controlled, repeated-measures experiment examining the effects of caffeine on delayed-onset muscle pain intensity and force loss in response to 64 eccentric actions of the dominant quadriceps induced by electrical stimulation.

In the study, nine low caffeine-consuming college-aged females ingested caffeine or placebo 24 and 48 hours following electrically stimulated eccentric exercise of the quadriceps. One hour after ingestion, maximal voluntary isometric contractions (MVIC) and submaximal voluntary eccentric actions were used to determine force loss during activation of damaged quadriceps and whether caffeine attenuates muscle pain intensity.

Pain intensity was measured using a zero to 100 visual analog scale. Caffeine produced a large, statistically significant hypoalgesia (diminished pain in response to a normally painful stimulus) during the MVIC. The reduction in pain scores during submaximal voluntary eccentric movements was smaller, as was the increase in MVIC force. Researchers found that consuming caffeine (equal to approximately 2 cups of brewed coffee) an hour before exercise reduced muscle pain afterwards by up to 48 percent.

However, because the study only involved nine women with low caffeine intake, the results may not be applicable to the more general population, particularly regular caffeine users.

Researchers concluded that caffeine could produce a large reduction in pain resulting from eccentric exercise-induced, delayed-onset muscle injury.

Reference: 1) Maridakis V, O'connor PJ, Dudley GA, McCully KK. Caffeine Attenuates Delayed-Onset Muscle Pain and Force Loss Following Eccentric Exercise. *J Pain*. 2006 Dec 8; [Epub ahead of print] 22 Jan 2006. [View Abstract](#).

## Selenium Supplements for HIV

Daily selenium supplements, in combination with traditional anti-retroviral therapy, may control the viral load associated with HIV and boost the numbers of immune cells, reports a new study.

Researchers at the University of Miami and Florida International University explained that despite findings that selenium supplementation may improve immune functioning, definitive evidence of its impact on human immunodeficiency virus (HIV) disease severity is lacking.

The double-blind, randomized, placebo-controlled trial evaluated the effects of high selenium yeast supplementation (200mcg/day). Intention-to-treat analysis assessed the effect on HIV-1 viral load and CD4 count after nine months of treatment. Unless otherwise indicated, values were presented as mean +/- SD.

Among the 450 HIV-1-seropositive men and women who underwent screening, 262 initiated treatment and 174 completed the nine-month follow-up assessment. Mean adherence to study treatment was good (73 percent +/- 24.7 percent) with no related adverse events. The intention-to-treat analyses indicated that the mean change (Delta) in serum selenium concentration increased significantly in the selenium-treated group and not the placebo-treated group and greater levels predicted decreased HIV-1 viral load, which predicted increased CD4 count.

Researchers noted that the findings remained significant after covarying age, sex, ethnicity, income, education, current and past cocaine and other drug use, HIV symptom classification, antiretroviral medication regimen and adherence, time since HIV diagnosis and hepatitis C virus coinfection.

Follow-up analyses evaluating treatment effectiveness indicated that the nonresponding selenium-treated subjects whose serum selenium change was less than or equal to 26.1mcg/L displayed poor treatment adherence (56.8 percent +/- 29.8 percent), HIV-1 viral load elevation and decreased CD4 count.

In contrast, selenium-treated subjects whose serum selenium increase was greater than 26.1mcg/L evidenced excellent treatment adherence (86.2 percent +/- 13.0 percent), no change in HIV-1 viral load and an increase in CD4 count.

The study concluded that daily selenium supplementation may suppress the progression of HIV-1 viral burden and provide indirect improvement of CD4 count. Selenium may be a simple, inexpensive and safe adjunct therapy in HIV spectrum disease.

Reference: 1) Hurwitz BE, Kalus JR, Llabre MM, et al. Suppression of Human Immunodeficiency Virus Type 1 Viral Load with Selenium Supplementation: A Randomized Controlled Trial. Arch Intern Med. 2007 Jan 22;167(2):148-154. [View Abstract](#).

## Tomatoes and Broccoli for Prostate Cancer

There may be an additive effect when tomatoes and broccoli are eaten together that protects against prostate cancer, a new study reports.

Researchers at the University of Illinois and James Cancer Hospital and Solove Research Institute explained that the consumption of diets containing five to 10 servings of fruits and vegetables daily is the foundation of public health recommendations for cancer prevention, yet this concept has not been tested in experimental models of prostate cancer.

The study evaluated combinations of tomato and broccoli in the Dunning R3327-H prostate adenocarcinoma model. Two-hundred and six male Copenhagen rats were fed diets containing 10 percent tomato, 10 percent broccoli, 5 percent tomato plus 5 percent broccoli (5:5 combination), 10 percent tomato plus 10 percent broccoli (10:10 combination) powders, or lycopene (23 or 224 nmol/g diet) for approximately 22 weeks starting one month prior to receiving s.c. tumor implants.

Scientists compared the effects of diet to surgical castration (two weeks before termination) or finasteride (5 mg/kg body weight orally, 6 days/week). Castration reduced prostate weights, tumor area and tumor weight, whereas finasteride reduced prostate weights, but had no effect on tumor area or weight.

Lycopene at 23 or 224 nmol/g of the diet insignificantly reduced tumor weights by seven percent or 18 percent, respectively, whereas tomato reduced tumor weight by 34 percent. Broccoli decreased tumor weights by 42 percent whereas the 10:10 combination caused a 52 percent decrease.

Tumor growth reductions were associated with reduced proliferation and increased apoptosis (cell death), as quantified by proliferating cell nuclear antigen immunohistochemistry and the ApopTag assay.

Researchers concluded that the combination of tomato and broccoli was more effective at slowing tumor growth than tomato or broccoli alone supporting public health recommendations to increase the intake of a variety of plant components.

1) Canene-Adams K, Lindshield BL, Wang S, et al. Combinations of tomato and broccoli enhance antitumor activity in dunning r3327-h prostate adenocarcinomas. *Cancer Res.* 2007 Jan 15;67(2):836-43. Epub 2007 Jan 9. [View Abstract](#)

## Iron Deficiencies in Infants

Young children may be at risk for iron deficiencies when they make the transition from breast milk or formula to more solid foods, a new study reports.

Researchers at Pennsylvania State University suggest that the lack of sufficient iron intake may significantly delay the development of the central nervous system because of alternations in morphology, neurochemistry and bioenergetics.

Researchers report that depending on the stage of development at the time of iron deficiency, there may be an opportunity to reverse adverse effects, but the success of repletion efforts may be time-dependent.

In the report, preclinical and clinical studies identifying the regions of the brain and behaviors affected, and perhaps irreversibly altered, by early-life iron deficiency in humans, monkeys and rodents were examined.

Data in monkeys show significant effects on neurodevelopment with dietary iron deficiency. Findings in human infants are consistent with altered myelination (the second of two changes during brain development after birth; the process during which neurons and dendrites become coated with a fatty substance, myelin, to enable neural impulses to travel faster) and changes in monoamine functioning. Rodent studies show that effects of iron deficiency during gestation (pregnancy) and lactation persist despite restoration of iron status at weaning.

The report concluded that the cross-species studies may indicate a vulnerable period in early development that may result in long-lasting damage.

For more information on iron and other dietary supplements, please visit [Natural Standard's Herbs & Supplements](#) database.

Reference: 1) Beard J. Recent Evidence from Human and Animal Studies Regarding Iron Status and Infant Development. *J Nutr.* 2007 Feb;137(2):524S-30S. [View Abstract.](#)

## **Acupuncture for Knee Pain**

Auricular (ear) acupuncture may reduce the need for pain medication following ambulatory knee surgery, a new study suggests.

Researchers from the Department of Anesthesiology and Intensive Care Medicine at the Ernst Moritz Arndt University in Germany investigated the use of auricular acupuncture versus an invasive needle control procedure for complementary analgesia after ambulatory knee surgery.

Acupuncture is the practice of inserting needles into specific points along the body's meridian system to treat disease, relieve pain and balance the flow of Qi in the body. Auricular acupuncture is based on the idea that the ear is a microcosm of the body. Auricular acupuncturists apply acupuncture needles to certain points on the ear thought to affect corresponding organs.

In the study, 120 patients who were undergoing ambulatory arthroscopic knee surgery under general anesthesia were randomized to receive either auricular acupuncture or a control procedure. Fixed indwelling acupuncture needles were inserted before surgery and were not removed until the following morning. Postoperative rescue analgesia was used to achieve pain intensity less than 40 mm based upon a 10 mm visual analogue scale.

The primary outcome measure utilized was the amount of postoperative ibuprofen required between surgery and an examination on the following morning.

Upon analysis, this study revealed that control group patients required more ibuprofen than patients who received auricular acupuncture (approximately 600mg versus approximately 200mg of ibuprofen, respectively). However, the intensity of pain experienced in each of the two groups as measured by the visual analogue scale was similar.

Researchers concluded that auricular acupuncture may help reduce the amount of pain medication required following ambulatory knee surgery in comparison to a control procedure.

Reference: 1) Usichenko TI, Kuchling S, Witstruck T, et al. Auricular acupuncture for pain relief after ambulatory knee surgery: a randomized trial. *MAJ*. 2007 Jan 16;176(2):179-83. Comment in: *CMAJ*. 2007 Jan 16;176(2):193-4. [View Abstract](#).

## **Red Meat, Heart Disease and Diabetes**

High consumption of red meat and heme iron (an easily absorbed dietary iron) may increase the risk of coronary heart disease (CHD) among diabetics by 50 percent, a new study reports.

Researchers at Harvard School of Public Health in Boston examined the association of long-term intakes of dietary iron and red meat with CHD risk among 6,161 women who reported a diagnosis of type 2 diabetes.

During 54,455 person-years of follow-up from 1980 through 2000, researchers documented 550 incident cases of CHD. After adjustment for age and BMI (body mass index), high intakes of both heme iron and red meat were associated with a significantly increased risk of fatal CHD, coronary revascularization (restoring blood flow to the heart) and total CHD.

The study found that women with the highest intake of heme iron had 50 percent (6-94 percent) increased risk of total CHD compared with those with the lowest intake. Further adjustment for other lifestyle and dietary factors did not appreciably change the associations. The positive association between heme iron and red meat intakes and CHD was more evident among postmenopausal women compared with premenopausal women.

Researchers concluded that based on the data, higher consumption of heme iron and red meat may increase CHD risk among women with type 2 diabetes. However, researchers also noted that the results do not prove that increased heme iron consumption from red meat is the actual cause of the apparent increase in CHD risk.

Reference: 1) Qi L, van Dam RM, Rexrode K, Hu FB. Heme iron from diet as a risk factor for coronary heart disease in women with type 2 diabetes. *Diabetes Care*. 2007 Jan;30(1):101-6. [View Abstract](#)