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New Research Highlights Omega-3 Fish Oil Benefits on Mood and Thinking Ability

Two new studies expand on the roles of omega-3 fish oils in maintaining normal moods and cognition. Conversely, low levels of these essential nutrients can lead to mood problems and poorer thinking abilities.

In the first study, Sarah M. Conklin, PhD, of the University of Pittsburgh, Pennsylvania, and her colleagues analyzed mood and personality in 105 middle-age men and women with elevated cholesterol levels. Three psychiatric tests were used: the Beck Depression Inventory, the Barratt Impulsiveness Scale, and the NEO Five-Factor Inventory, which assesses neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness.

Conklin and her colleagues also measured the subjects' blood levels of levels of three omega-3 fats: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). ALA, found in leafy green vegetables, is the parent molecule of other omega-3 fats. EPA and DHA are found in fish.

Although the study did not show a direct cause and effect, it did find strong correlations. People with higher levels of EPA and DHA were less likely to be depressed, neurotic, or impulsive. In addition, high DHA levels were associated with more agreeable behaviors, and high ALA levels were related to less impulsive behavior.

"A number of small controlled trials have reported improvements in mood and reductions in impulsive and aggressive behaviors following increases in dietary omega-3," wrote Conklin and her colleagues.

They added, "Dietary polyunsaturated fatty acids [PUFAs] are rapidly delivered to the brain via blood. Once in the brain, PUFAs incorporate into neural membranes by anchoring within the phospholipids and influence the physical properties of the membrane..."

In contrast, the researchers noted, the omega-6 fats have pro-inflammatory properties, and a higher ratio of omega-6s to omega-3s creates a cerebral environment that encourages inflammation.

In the second study, Susan L. Prescott, MBBS, PhD, and her colleagues at the University of Western Australia, Perth, studied the mental development of 72 toddlers. The childrens' mothers were given either omega-3 fish oils or placebos from the 20th week of pregnancy through delivery. The fish oils provided 2.2 grams of DHA and 1.1 grams of EPA daily – fairly large amounts.

Prescott found that, at two and one-half years of age, the children of mothers who took fish oil supplements had significantly better hand and eye coordination compared with those whose mothers had received placebos. In addition, the children fared slightly better in terms of walking, social interactions, speech, hearing, reasoning, and general performance, though the difference was not statistically significant compared with the placebo group.

In addition, Prescott reported that the large amounts of fish oils did not have any negative effects on neurodevelopment or growth.

"Our finding of enhanced eye and hand coordination with fish oil supplementation is plausible and consistent with previously reported benefits on visual function after postnatal omega-3 polyunsaturated supplementation in both preterm and term infants."

References: Conklin SM, Harris JI, Manuck SB, et al. Serum omega-3 fatty acids are associated with variation in mood, personality and behavior in hypercholesterolemic community volunteers. *Psychiatry Research*, 2007, epub ahead of print: doi:10.1016/j.psychres.2006.10.006. Dunstan JA, Simmer K, Dixon G, et al. Cognitive assessment of children at age 2 1/2 years after maternal fish oil supplementation in pregnancy: a randomized controlled trial. *Archives of Diseases of Childhood*, epub ahead of print: doi:10.1136/adc.2006.099085. ❑

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Note: For more information about food and mood, and free excerpts from Jack Challem's latest book, visit www.foodmoodsolution.com.

Perspectives...

The Risk of Genetically Modified Foods

In a study published in the March 13, 2007 *Archives of Environmental Contamination and Toxicology*, researchers re-analyzed data from Monsanto-sponsored experiments in which a type of genetically modified corn (MON863) was fed to laboratory rats for three months. The data had been company confidential until a German court ruled that the public could have access to the data for 90 days.

Using this data, French researchers found that consumption of the genetically modified corn led to disturbing changes in the laboratory rats. Male rats lost an average of 3.3 percent of body weight, while female rats gained 3.7 percent weight compared with controls. The animals showed signs of liver and kidney toxicity. Blood sugar levels rose, and the animals had a 24 to 40 percent increase in triglyceride levels, which would point to a greater risk of diabetes and heart disease.

The MON863 produces an insecticide that kills the corn roundworm, but like other synthetic pesticides, it appears to have broader deleterious effects. The genetic modification of food tampers with the normal biological evolution of plants in ways that would not likely occur in nature. By consequence, these changes can affect the genetic programming of species that consume them. The specific mechanisms may be subtle and as yet undetermined, but it's clear that genetically modified foods can have unwanted health consequences.

Our genes are particularly sensitive to toxins and to low levels of nutrients and toxins, with the consequence being an increased risk of cancer and other diseases, and risk may be passed to offspring.

A single toxin might not have much of an effect on our health. But when you add it to the thousands of other toxic chemicals in our food and environment, we move closer to our individual tipping points – the threshold at which our innate ability to defend ourselves and repair genetic damage falters. We may not be able to control all of the hazards in our foods and environment, but it is irrational to unnecessarily expose ourselves to any more than we must.

Monsanto has promoted genetically modified foods as a way of increasing crop yields and reducing worldwide hunger. Such statements are more self-serving media spin than altruism. No decrease in world hunger can be attributed to the use of genetically modified foods. Rather, Monsanto and other companies have created a "need" and new agricultural markets for unnecessary and harmful products. We may actually be better off with less than more corn, one of the most common food allergens. *–JC*

Herbal Supplement May Be of Benefit in Urinary Tract Infections

An herbal supplement sold in health food stores – forskolin – may be of benefit in treating urinary tract infections, based on the findings of an animal study published in *Nature Medicine*, a leading journal.

Soman N. Abraham, PhD, of Duke University, Durham, North Carolina, and his colleagues investigated the activity of *Escherichia coli*, the bacterium that causes 90 percent of urinary tract infections. Such infections are often difficult to eradicate, even with antibiotics. That's because some of the bacteria avoid exposure to antibiotics by hiding in tiny crevices within the bladder. They eventually replicate, move back into the urinary tract, and cause recurrent infections.

In a study using mice, Abraham found that boosting the body's levels of cyclic adenosine monophosphate (cAMP), a cell-communication molecule, helped flush out *E. coli* from their hiding places in the bladder.

Forskolin is a particularly potent promoter of cAMP, and Abraham reported that it dislodged more than 99 percent of *E. coli* from the bladder's crevices, known technically as fusiform vesicles. Once the *E. coli* are pushed into the urine, antibiotics can easily eradicate them.

Forskolin is obtained from the Indian coleus plant. The supplement is available at most health food stores.

Reference: Bishop BL, Duncan MJ, Song J, et al. Cyclic AMP-regulated exocytosis of *Escherichia coli* from infected bladder epithelial cells. *Nature Medicine*, 2007. Epub ahead of print: doi:10.1038/nm1572. ❑

Zinc Carnosine Supplements May Help Prevent and Heal Gut Damage

British researchers recently noted in the journal *Gut* that several companies sell zinc supplements claiming that it has "value for gastric health." After conducting a battery of experiments in cells, laboratory mice and rats, and people, the researchers reported that zinc carnosine supplements do in fact protect the gut from damage and promote the healing of injured gut lining.

Zinc carnosine combines two important nutrients. Zinc is an essential nutrient, and carnosine is an antioxidant formed from two amino acids (or protein building blocks), specifically alanine and histadine.

Ray J. Playford, MB, PhD, and his colleagues at Queen Mary's School of Medicine and Denistry, London, investigated whether zinc carnosine could prevent and heal gut injury caused by indomethacin, a nonsteroidal anti-inflammatory drug (NSAID).

In the human phase of the experiments, Playford asked five of 10 healthy subjects to take 37.5 mg of zinc carnosine twice daily for one week. After several more days, all 10 of the subjects were given standard clinical doses of 50 mg of indomethacin three times daily for five days.

The people who took zinc carnosine experienced no increase in gut permeability from indomethacin. However, in people not taking zinc carnosine, indomethacin resulted in a threefold increase in gut permeability, which could lead to leaky gut syndrome or peptic ulcers.

In experiments with human colon cells, zinc carnosine promoted a three-fold movement and proliferation of healthy cells, a sign consistent with gut healing. Similarly, in the animal studies, zinc carnosine significantly decreased gastric and small intestine injury from indomethacin.

NSAIDS are one of the most prescribed drugs, wrote Playford. Ten to 30 percent of patients taking NSAIDS have peptic ulcers, often without obvious symptoms. He added that 70 percent of patients taking NSAIDS have some degree of gastrointestinal disease with "low-grade blood and protein loss."

Reference: Mahmood A, Fitzgerald AJ, Marchbank T, et al. Zinc carnosine, a health food supplement that stabilizes small bowel integrity and stimulates gut repair processes. *Gut*, 2007;56:168-175. ❑

High Vitamin D Levels May Boost Protection Against Colorectal Cancer

Relatively modest increases in vitamin D levels can slash the risk of developing colorectal cancer.

Edward D. Gorham, MPH, PhD, of the University of California, San Diego, and his colleagues pooled the findings of five previous studies on vitamin D and colorectal cancer. Patients with the highest blood levels of vitamin D were half as likely to develop colorectal cancer, compared with people who had the lowest levels.

However, the highest levels of vitamin D in the study could be considered no better than low normal, hinting that larger amounts of vitamin D might further lower the risk of colorectal cancer.

Gorham and his colleagues found that people with an average level of 33 ng/ml of vitamin D in their blood had the lowest risk of colorectal cancer, compared with those who had only 12 ng/ml of vitamin D. He pointed out that most people could achieve 33 ng/ml by taking 1,000-2,000 IU of vitamin D_3 daily. (Vitamin D_2 has only two-thirds the activity of vitamin D_3).

Normal levels of vitamin D range from 33 to 80 ng/ml, while the norm in sunny countries ranges from 54 to 90 mg/ml. Levels below 20 ng/ml are considered deficient, and 20 to 32 ng/ml is regarded as insufficient.

Vitamin D may be measured in laboratory tests in either ng/ml or nmol. One ng/ml equals 2.5 nmol of 25-hydroxy vitamin D, which is often abbreviated as 25 (OH) D.

Reference: Gorham ED, Garland CF, Garland FC, et al. Optimal vitamin D status for colorectal cancer prevention. A quantitative meta analysis. *American Journal of Preventive Medicine*, 2007;32: 210-216. ❑

Prenatal Supplements Improve Birth Weight, Lower Risk of Death

Two new studies highlight the importance of prenatal vitamins in reducing the risk of low birth weight infants. The research focused on pregnant women and their infants in Tanzania and India.

In the first study, Wafie W. Fawzi, MB, DrPh, of Harvard University, and his colleagues provided a moderately high-potency daily vitamin supplement or placebos to 8,468 pregnant women in Tanzania. The supplement contained eight vitamins – vitamins C and E and the B complex. In addition to receiving either the vitamin supplements or placebos, all of the women were given supplemental iron and folic acid.

Overall, the vitamin supplements reduced the risk of low birth weight infants by 18 percent. The supplements also lowered the risk of "small-for-gestational-age births" by 23 percent, as well as the risk of anemia in the mothers by 12 percent.

In the other study, Piyush Gupta, MD, of the University College of Medical Sciences, Delhi, India, and his colleagues also gave either vitamin supplements or placebos to 200 pregnant women. All of the women were undernourished and very thin. In this case, the supplement consisted of relatively low levels of 29 vitamins and minerals. Again, all of the mothers were given supplemental iron and folic acid.

Babies born to mothers who had taken the vitamin/mineral supplements weighed an average one-fifth of a pound more, compared with babies born to mothers who had taken placebos. The incidence of low birth weight infants decreased from 43 to 16 percent, about a 70 percent decrease. In addition, infant deaths decreased by about half.

Reference: Fawzi WW, Msamanga GI, Urassa W, et al. Vitamins and perinatal outcomes among HIV-negative women in Tanzania. *New England Journal of Medicine*, 2007;356:1423-1431. Gupta P, Ray M, Dua T, et al. Multimicronutrient supplementation for undernourished pregnant women and the birth size of their offsping. *Archives of Pediatric and Adolescent Medicine*, 2007;161:58-64. ❑

Quick Reviews of Recent Research

• Vitamin E may prevent muscle atrophy

A lack of physical activity leads to muscle atrophy. French researchers explored whether supplemental vitamin E would reduce the breakdown of muscle tissue, focusing specifically on the soleus muscle (located just above the ankle) in laboratory rats. Supplemental vitamin E prevented a decrease in the size of muscle fibers and significantly reduced atrophy of the soleus muscle during a 14-day experiment. Based on their findings, the researchers wrote that vitamin E might modify genes involved in breaking down muscle.

Servais S, et al. *Free Radical Biology and Medicine*, 2007;42:627-635.

• Low vitamin D related to moods in fibromyalgia

Researchers from Northern Ireland investigated the relationship between anxiety and depression and vitamin D levels in 75 patients diagnosed with fibromyalgia. They wrote that low vitamin D levels are common in people with the disease. Patients deficient in vitamin D were more likely to be anxious or depressed. However, vitamin D levels did not appear to impact musculoskeletal symptoms.

Armstrong DJ, et a. *Clinical Rheumatology*, 2007;26:551-554.

• Low magnesium levels complicate diabetes

The prevalence of low or marginal magnesium levels ranges from about 13 to 48 percent among people with type 2 diabetes. Low magnesium levels contribute to poor glycemic control, high blood pressure, heart disease, and such diabetic complications as eye disease, kidney disease, and nerve problems. American researchers wrote that low magnesium levels may be related to a variety of factors, including poor diet, impaired kidney function, metabolic acidosis, and abnormal insulin function. They recommended that "it is prudent to monitor magnesium routinely" among patients with type 2 diabetes.

Pham PCT, et al. *Clinical Journal of the American Society of Nephrology*, 2007;2:366-373.

• Cinnamon fruit may have anti-cancer benefits

Most people are familiar with cinnamon sticks and cinnamon powder, both made from the plant's bark. Indian researchers tested whether the dried fruits of cinnamon might have health benefits. In experiments, they found that this "under-utilized and conventional part" of cinnamon was rich in antioxidants and could reduce significantly genetic mutations.

Jayapraskasha GK, et al. *Journal of Food Composition and Analysis*, 2007;20:330-336.

• Trans fats again linked to greater heart disease risk

American researchers tracked 166 women diagnosed with heart disease and 327 women without heart problems, all drawn from a database of almost 33,000 female nurses. Women with the highest consumption of trans fats were more than three times more likely to develop heart disease. Trans fats are most often found in fried foods, baked goods, and hard margarine.

Sun Q, et al. *Circulation*, 2007;115:1858-1865.

• Vitamin D Supplements Would Slash Cancer Costs

American researchers calculated the benefits if Americans and Europeans supplemented with 1,000 IU of vitamin D daily. They estimated that vitamin D would reduce the risk of cancers by 7 percent for American men and 9 percent for American women, as well as by 14 percent for northern European men and 20 percent for northern European women. The researchers projected that vitamin D supplements for all adult Americans would cost about $1 billion, but that the supplements would save $16 to $25 billion in medical costs.

Grant WB, et al. *Cancer Prevention*, 2007;174: 225-234.

• Infants benefit from their mother's eating seafood

Pregnant women are commonly advised to restrict their consumption of seafood to less than three-fourths of a pound weekly, in an effort to limit mercury intake. In a study of 11,875 pregnant women, American and British researchers found that women who consumed little seafood had children more likely to have problems with verbal intelligence, communication, social behavior, fine motor skills. They noted that fish, the major source of omega-3 fats, is needed for normal neural development. The researchers wrote that "advice to limit seafood consumption could actually be detrimental."

Hibbeln JR, et al. *Lancet*, 2007;369:578-585.

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