



## A Selection of Recent Findings in the Field of Nutrition

### **Fish-oil supplementation enhances the effects of strength training in elderly women.**

Fish oil (FO) plays important roles in supporting cardiovascular health and in cell functions. Western diets can often be low in n-3 Poly-unsaturated fatty acids (PUFAs), which are found in fish oils that aid in increasing nerve conduction and improve heart contractions. Factors such as aging, neural degenerative disorders, a lack of physical activity and changes in nutrition would affect strength and functional capacity. This study evaluated the change in functional capacity and muscle strength in elderly women supplemented with fish oil. Subjects included 45 women with a mean age of 64 years, who were randomized into three groups: ST group (strength training only group), ST90 group (strength training and fish oils for 90 days), ST150 (consuming fish oils for 60 days before strength training and continuing supplementation for 90 days with strength training). Participants were consuming 2g of fish oil daily consisting of approximately 0.4g EPA and 0.3g DHA. In the ST90 group there were better performances post-training than at pre-training comparisons. There were more marked increases in the rate of torque development (RTD) and peak torque in the post-training group when they evaluated the knee flexors, knee extensors, plantar flexors and dorsi flexors. In addition, the pre-training values for the electromechanical delay (EMD) in subjects who were similar for EMD at pre-training, were found to have lower values for EMD in post-training amongst ST90 and ST150. This translates into improved muscle activation compared to the ST group. Finally, as a measure of functional capacity, participants were asked to perform activities. Participants in the ST90 and ST150 group were found to have better performance post-training, which was evident as there were more significant improvements in the repetitions these groups could complete compared to the ST group. However, the study observed that 60 days of FO pre-training did not cause significant improvements in functional capacity and strength training. The study included that the diets of participants remained similar throughout the study and no changes in body mass were evident. The authors concluded “the use of FO supplementation in addition to strength training potentiates the neuromuscular system, enhancing the muscle strength and the functional capacity in elderly women”.

[Rodacki CLN, et al. *Am J Clin Nutr* 2012; 95:428-436]

### **Folic acid supplementation during pregnancy may protect against depression 21 months after pregnancy, an effect modified by MTHFR C677T genotype.**

Several studies reported an association between low folate levels and depression in the general population. The demand for folate increases during pregnancy, therefore, without adequate supplementation, folate concentrations begin to decrease from the fifth month of pregnancy onto several months after childbirth. This study aimed to investigate if high folate intake during pregnancy could protect mothers from depression both during pregnancy and postpartum. Methyltetrahydrofolate reductase (MTHFR) is an enzyme involved in the metabolism of folate. Once activated, MTHFR synthesizes a methyl donor so that methionine can be produced from homocysteine-a S-adenosyl-L-methionine precursor. C677T is a polymorphism in the MTHFR gene. This determines MTHFR activity and eventually, circulating homocysteine concentrations. Compared to CC homozygote alleles, TT homozygotes have higher homocysteine concentrations. With folic acid supplementation, the homocysteine level differences are reduced. Based on the above statement, this would mean that if low folate levels are associated with postpartum depression, then mothers having MTHFR C677T genotypes would be at risk of having higher instances of postpartum depression. Supplementation would then have greater protective effects on mothers with the MTHFR C677T TT genotype. In this population-based cohort prospective study, investigators examined self-reported depressive symptoms using Edinburgh Postnatal Depression Scale (EPDS). Investigators also looked at self-reported folic acid supplementation. This study further investigated the effects of MTHFR C677T genotype with regards to depression scores. The EPDS questionnaires were completed at both 18 and 32 weeks of pregnancy. EPDS questionnaires were also done at 8 weeks, 8 months, and 21 months postpartum. The authors concluded that supplementation with folic acid had no strong evidence in protecting against depression during pregnancy, or up to 8 months postpartum. However, comparing those not taking supplements to those taking supplements at 18 weeks pregnancy, there was suggested evidence that folic acid supplementation may help protect against an increase in depressive symptoms between 8 and 21 months postpartum, particularly in those with the MTHFR C677T TT genotype.

[Lewis SJ, et al. *Eur J Clin Nutr* 2012; 66:97-103]

### **Higher vitamin D intake is needed to achieve serum 25(OH) D levels greater than 50 nmol/L in Quebec youth at high risk of obesity.**

Adequate levels of Vitamin D are required for the maintenance of bone mass and glucose homeostasis, as well as potentially being protective of breast and colorectal cancers. Inadequate levels of vitamin D may lead to rickets, a condition typically occurring in children characterized by weakening or softening of the bones. Observations of vitamin D deficiency are apparent amongst the Canadian youth due to several causes. This study evaluated the modifiable causes of vitamin D insufficiency and the necessity to ensure adequate intake of Vitamin D from food supply to support levels. The study selected 159 Caucasian children 75 km within Montreal and Quebec City. The average age of the participants were 9.2 years, with 42.1% at 85<sup>th</sup> percentile for BMI or greater and on average consuming 1767 kcal per day. In order to prevent rickets, the Institute of Medicine recommends an adequate level of vitamin D intake. They define vitamin D deficiency at  $\leq 27.5$  nmol/L and the American Association for

Pediatrics defines it at 50nmol/L. It was found that 45% of participants studied had levels < 50nmol/L. Multiple regression analysis was used to determine the effect the variable foods/supplements/activity and adiposity had on plasma 25(OH) D. Based upon the measurements, it was noted that Vitamin D levels were lower by 8.6nmol/L for participants when measured in the winter/spring, where on average participants consumed a total of 6.6mcg/day (264 IU/day) of vitamin D from diet and supplements combined. Season had the biggest effect on vitamin D levels, while adiposity did not result in changes in levels of plasma 25(OH) D. The study found that increasing milk consumption by one serving resulted in an increase of plasma 25(OH) D levels by 2.9nmol/L. They also found that activity lead to a change in plasma 25(OH) D levels by 3% after considering season and sex of participants. The authors concluded: "it is unlikely that increasing milk consumption or increasing (outdoor) physical activity would increase vitamin D status sufficiently to achieve 25(OH) D levels >50nmol/L in Canadian youth who have low vitamin D status.

[Mark S, et al. *Eur J Clin Nutr* 2011; 65:484-492]

### **Vitamin B12, cognition, and brain MRI measures. A cross-sectional examination.**

Recent studies examined cognitive performance and structural brain abnormalities with regards to vitamin B12 levels. In their previous reports, the authors had found that brain MRI measures and cognitive performance were associated with one another. They had identified that a 6 year cognitive reduction was associated with serum levels of vitamin B12 and methylmalonic acid (MMA). Stratified random samples of 121 participants were used to help investigators link the relationship of serum vitamin B12 markers with cerebral infarctions, brain volumes, and performance in a biracial population. In this study, neuropsychological tests of five cognitive domains and brain MRI measures were analyzed in biracial participants. The neuropsychological tests included measures of: episodic memory, visuospatial ability, perceptual speed, semantic memory, and working memory. Investigators found that methylmalonate (a vitamin B12 related marker) was associated with lower episodic memory and perceptual speed. In addition, it was found that higher cystathionin and 2-methylcitrate were associated with decreased semantic and episodic memory. The authors conclude that methylmalonate may in fact reduce total brain volume (TBV), however, homocysteine effects on cognitive performance is dictated via white matter hyper intensity and cerebral infarctions.

[Tangney CC, et al. *Neurology* 2011; 77:1276-1282]

### **Suggested readings:**

#### **Dietary intake of n-3 and n-6 fatty acids and the risk of clinical depression in women: a 10-y prospective follow-up study.**

[Lucas M, et al. *Am J Clin Nutr* 2011;93:1337-1343]

#### **Folic acid and prevention of colorectal adenomas: a combined analysis of randomized clinical trials.**

[Figueiredo JC, et al. *Int J Cancer* 2011;129:192-203]

#### **Do specific dietary constituents and supplements affect mental energy? Review of evidence.**

[Groby HE, et al. *Nutr Rev* 2011; 68:697-718]

#### **Urinary tract stone occurrence in the Women's Health Initiative (WHI) randomized clinical trial of calcium and vitamin D supplements**

[Wallace RB, et al. *Am J Clin Nutr* 2011;94:270-277]

#### **Efficacy of calcium supplementation for management of overweight and obesity: systemic review of randomized clinical trials.**

[Onakpoya IJ, et al. *Nut Rev* 2011; 69:335-343]

#### **Suboptimal vitamin D levels in pregnant women despite supplement use.**

[Li W, et al. *Can J Public Health* 2011; 102: 308-312]

#### **Plasma omega-3 fatty acids and incident diabetes in older adults.**

[Djoussé L, et al. *Am J Clin Nutr* 2011; 94:527-533]

#### **Intake of antioxidants during pregnancy and the risk of allergies and asthma in the offspring.**

[Nwaru BI, et al. *Eur J Clin Nutr* 2011; 65: 937-943]

#### **Calcium and vitamin D and risk of colorectal cancer: results from a large population-based case-control study in Newfoundland and Labrador and Ontario.**

[Sub Z, et al. *Can J Public Health* 2011; 102:382-389]

#### **Maternal one-carbon nutrient intake and cancer risk in offspring.**

[Ciappio ED, et al. *Nutr Rev* 2011; 69:561-571]

#### **Coffee consumption and risk of stroke: a dose-response meta-analysis of prospective studies.**

[Larsson SC, et al. *Am J Epidemiol* 2011; 174:993-1001]

#### **Folic acid supplements modify the adverse effects of maternal smoking on fetal growth and neonatal complications.**

[Bakker R, et al. *J Nutr* 2011; 141: 2172-2179]