

# ASN Publications

## November 2013 Media Alert: *The Journal of Nutrition*

The following articles are being published in the November 2013 issue of *The Journal of Nutrition*, a publication of the American Society for Nutrition. Summaries of the selected articles appear below; the full text of each article is available by clicking on the links listed. Manuscripts published in

*The Journal of Nutrition* are embargoed until the article appears online either as in press (Articles in Press) or as a final version. The embargoes for the following articles have expired.

### **Researchers uncover new ways to detect marginal vitamin B-6 deficiency**

### **Seaweed extract may enhance the elderly's response to influenza vaccine**

### **Diets best matching current recommendations related to less cognitive decline**

### **Researchers uncover new ways to detect marginal vitamin B-6 deficiency**

Nutrition scientists have long understood the critical nature of the B vitamins in human metabolism. More recently, however, insufficient intake of these vitamins has also been associated with increased risks for a variety of serious health conditions such as cardiovascular disease. Although the exact reason for this association is not known, there is growing evidence that modulation of inflammatory processes is involved. Some of the B vitamins, particularly B-6, B-12 and folate, are involved in shuttling single-carbon atoms from one molecule to another - a critical process needed for myriad chemical reactions. Vitamin B-6 also is required for the breakdown and transformation of the amino acid tryptophan, and low levels of vitamin B-6 in the blood have been associated with inflammation in some studies. Understanding these relationships is, therefore, likely to lead to better assessment and prevention of inflammatory conditions and situations involving a dysregulation of single-carbon transfer reactions affecting human health. In a study published in the November 2013 issue of *The Journal of Nutrition*, an interdisciplinary team comprised of US and Norwegian researchers led by Dr. Jesse Gregory (Institute of Food and Agricultural Sciences, University of Florida) report their findings that marginal vitamin B-6 deficiency can indeed shift circulating levels of various substances in the blood, and that these compounds might be useful in monitoring a person's vitamin B-6 nutritional status.

This study was carried out as a 28-day dietary intervention trial at the University of Florida's Clinical Research Center (a resource of the Clinical and Translational Science Institute) where 23 healthy men and women were evaluated before and after consuming a controlled diet low in vitamin B-6 but adequate in all other essential nutrients. Blood samples were drawn at the beginning and end of the dietary intervention period and analyzed for

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compounds (metabolites) involved in tryptophan breakdown and single-carbon reactions. The researchers then evaluated which of these metabolites and compounds shifted the most in concentration during the period of marginal vitamin B-6 deficiency.

The researchers found many compounds that either increased or decreased in concentration in response to vitamin B-6 insufficiency. For instance, there were increases in cystathione and serine and decreases in creatine, creatinine, and dimethylglycine. In the tryptophan pathway, vitamin B-6 restriction resulted in lower levels of kynurenic acid and higher 3-hydroxykynurenone. They concluded that profiles of these substances in the blood could be useful to clinicians and researchers as indicators of marginal vitamin B-6 deficiency and to better understand its clinical and subclinical manifestations.

**Reference** da Silva V, Rioa-Avila L, Lamers Y, Ralat MA, Midttun Ø, Quinlivan EP, Garrett TJ, Coats B, Shankar MN, Percival SS, Chi Y-Y, Muller KE, Ueland PM, Stacpoole PW, Gregory JF. Metabolite profile analysis reveals functional effects of 28-day vitamin B-6 restriction on one-carbon metabolism and tryptophan catabolic pathways in healthy men and women. *Journal of Nutrition* 143:1719-1727, 2013.

**For More Information** To contact the corresponding author, Dr. Jesse Gregory, please send an e-mail to [jfg@ufl.edu](mailto:jfg@ufl.edu).

### **Seaweed extract may enhance the elderly's response to influenza vaccine**

Seaweed, which is commonly consumed in some parts of the world such as Japan, is a good source of several essential nutrients such as iodine and folate. In addition, seaweed is often classified as a 'functional' food because its health benefits appear to go beyond basic nutrition - also being due to a complex group of phytochemicals it contains. As such, there is considerable interest in understanding the many compounds present in seaweed and whether they have independent and interactive effects on health. For instance, there is a growing literature related to the potential for some compounds in seaweed to act as anti-inflammatories. Others substances in seaweed have been reported to benefit the immune system. For example, complex carbohydrates such as mekabu fucoidan (MF) found in a form of seaweed have been shown to inhibit viral infections and enhance immune function in mice. Whether these effects are also seen in humans, however, is not known. To shed important light on this potentially beneficial effect of seaweed consumption, researchers at the Ajinkai Healthcare Corporation and Mukogawa Women's University (Japan) studied what happens to immune function when elderly individuals consume MF on a daily basis. Their results, published in the November 2013 issue of *The Journal of Nutrition*, support a beneficial effect in this particularly at-risk group.

The researchers conducted a randomized, placebo-controlled intervention trial (the gold standard in terms of experimental design) to test their hypotheses. A total of 70 men and women (mean age: 87 years) living in a group-care facility were recruited and asked to consume either 300 mg/day MF or a similar amount of inactive substance (placebo) with a similar appearance. The MF and placebo substances were mixed with each participant's lunch and consumed for 24 weeks, and at the 4th week each volunteer received his or her annual influenza vaccination. Blood was drawn at 5 and 20 weeks after vaccination to determine how well each person's immune system had responded.

Results indicated that, compared to the placebo group, the group consuming MF had higher antibody titers against the influenza virus vaccine. In addition, natural killer cell activity in the MF group tended to increase, whereas there was no such increase noted in the placebo group. In fact, natural killer cell activity decreased substantially in the placebo group. The authors concluded that MF (and therefore, seaweed) consumption might help the elderly in terms of their being able to mount an effective response to the

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### **Contact ASN**

Suzanne Price  
Communications Director  
9650 Rockville Pike  
Bethesda, MD 20814  
[media@nutrition.org](mailto:media@nutrition.org)  
301-634-7235

seasonal influenza vaccine, thus helping lower the risk of contracting influenza in this particularly at-risk population.

**Reference** Negishi H, Mori M, Mori H, Yamori Y. Supplementation of elderly Japanese men and women with fucoidan from seaweed increases immune responses to seasonal influenza vaccination. *Journal of Nutrition* 143:1794-1798, 2013.

**For More Information** To contact the corresponding author, Dr. Yukio Yamori, please send an e-mail to [yamori@cardiacstudy.com](mailto:yamori@cardiacstudy.com).

#### **Socioeconomic status and nutrition may interact to influence cognitive decline**

A typical US citizen can now expect to live until he or she is 79 years old, a lifespan substantially longer than a century ago when average life expectancy was only 47 years. Whereas this change represents important improvements in many aspects of the US standard of living, increasing lifespans are also accompanied by greater chance of developing chronic conditions such as cancer, heart disease, and age-related dementia. As such, researchers continue to study ways to prevent and treat these conditions so that longer life expectancy can go hand-in-hand with an acceptable quality of life. Perhaps one of the most studied areas in this regard is that of the relationship between nutrition and health. However, some studies suggest that whether a person benefits from a healthy diet may depend on other factors related to a person's socioeconomic situation (e.g., mental stimulation). To shed some light on this complex web of factors, a group of researchers led by Dr. Carol Greenwood and Matthew Parrott (Rotman Research Institute/Baycrest Health Sciences and the University of Toronto) studied the association between diet and cognitive function in a group of older adults with a range of socioeconomic levels. Their results are published in the November 2013 issue of *The Journal of Nutrition*.

This study was conducted in a subsample of the Quebec Longitudinal Study on Nutrition and Successful Aging (also called the The NuAge Study) which followed 1793 independently-living men and women between the ages of 68 and 84 years. To be eligible for the 4-year study, participants had to be relatively healthy, cognitively unimpaired, and free of disabilities in activities of daily living. Subjects annually complete a battery of questionnaires related to health, activities, diet, and socioeconomic status. Cognitive function was also evaluated annually. The researchers then grouped the participants into 3 clusters based on their income, occupational "prestige," and education. They also categorized participants in terms of how well their individual diets matched either current recommendations (a "prudent" diet) or a typical Western diet.

Individuals whose dietary patterns best matched current recommendations (e.g., higher levels of vegetables, fruits, fish, poultry, and lower-fat dairy products) tended to score better on the cognitive functions test at the beginning of the study. However, this effect was only apparent in people with the highest income levels, most education, or highest overall socioeconomic status. Nevertheless, individuals with low overall socioeconomic status still benefited from a more prudent diet by experiencing slower loss of cognitive function over time. Conversely, adherence to the Western pattern (e.g., meats, potatoes, processed foods, and higher-fat dairy products) was associated with more cognitive decline, but only in the group with the least education. The authors concluded, "Interventions promoting retention of cognitive function through improved diet quality would provide maximum benefit to those with relatively low socioeconomic status."

**Reference** Parrott MD, Shatenstein B, Ferland G, Payette H, Morais JA, Belleville S, Kergoat M-J, Gaudreau P, Greenwood CE. Relationship between diet quality and cognition depends on socioeconomic position in healthy older adults. *Journal of Nutrition* 143:1767-1773, 2013.

**For More Information** To contact the corresponding author, Dr. Carol Greenwood, please send an e-mail to [carol.greenwood@utoronto.ca](mailto:carol.greenwood@utoronto.ca).

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American Society for Nutrition | 9650 Rockville Pike | Bethesda | MD | 20814

