

# Nutrition In Medicine NEWS

Nutrition Education for  
Healthcare Professionals

February 2017

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## Special points of interest:

- ◆ Upcoming conferences
- ◆ Salt sensitivity
- ◆ Irritable bowel syndrome
- ◆ Muscle health
- ◆ Niacin deficiency
- ◆ Olive oil
- ◆ ...and more....

For information on obtaining continuing education credits for NIM modules, go to:

[nutritioninmedicine.org/CME/](http://nutritioninmedicine.org/CME/)

## What's New with NIM?

Here we are again at the start of another year, looking back at what we have done in 2016, and forward to what is coming up and at us.

A lot of nutrition learning happened last year! We had the largest number of active users so far, 7924, at 141 of 180 US medical and osteopathic schools, and at schools in 20 countries.

Our continuing collaboration with the NNEdPro network has taken us as far as India (below).



Students at R.G.Kar Medical College in Kolkata

This summer we will again contribute to the 3rd International Summit on Medical Nutrition Education and Research 2017 in Cambridge, UK, August 1-2. Don't miss a great opportunity to catch up on the latest nutrition education and research and hobnob with town and gown in this uniquely beautiful English university town.

Register at <http://www.nnedpro.org.uk/>

**Donations:** We thank all of you donors, it means a lot to us! Keep encouraging us with donations at <http://www.nutritioninmedicine.org/>

**Our 2016 medical nutrition education survey** is well on its way. If you have not already done so, please help us by responding as soon as possible! Go to <http://www.nutritioninmedicine.org/>

**Last call for CME credits:** Many of our NIM modules are approved for continuing medical education credits. Because our CME accreditor will be discontinuing their services, you have only until July 31, 2017, to get CME credits.

## Attention Medical School Students: Clinical Nutrition Internship Program – Applications due March 15, 2017

Applications are being accepted for the American Society for Nutrition's Clinical Nutrition Internship Program. This program is designed to increase the role of nutrition in the practice of medicine, medical research, health promotion, and disease prevention by providing a unique combination of educational experiences to medical students. Students are exposed to both clinical and academic aspects of nutrition during the 8-week internship. <http://www.nutrition.org/education-and-professional-development/graduate-and-professional-development/clinical-nutrition-internship-program/>

## Calling All Medical Nutrition Educators!

ASN will convene another symposium for Medical Nutrition Educators in Chicago. Save the date for Saturday, April 22, 1-6 pm! There will be presentations on student engagement, new curriculum guidelines, interprofessional and nutrition specialist training, and plenty of opportunities for networking.

We hope that you will be able to join us!

The UNC Nutrition Research Institute will convene on May 22-25 on the NC research campus in Kannapolis (near Charlotte, NC) a workshop on Nutrigenetics, Nutrigenomics, and Precision Nutrition. Graduate student and post-doc registration fees are subsidized. Register as soon as possible at

<http://www.uncnri.org/>

ASN<sup>20</sup>17 EB



Nutrigenetics, Nutrigenomics  
and Precision Nutrition

## Practical Nutrition: Breast cancer prevention

### Now we know, but will we act?

Evidence for the dietary prevention of cancer is as difficult to obtain as it gets because so many participants would have to adhere to a defined diet for a long time in a randomized trial. This gold standard has now been achieved. Over 4000 older women participated in a trial of almost 5 years duration. Some of the women were assigned to use a Mediterranean (Med) diet with added extra-virgin olive oil. The women in the Med plus olive oil group had 62% lower incidence of malignant breast cancer than those in the control group.

This is the first randomized trial investigating whether an olive-oil-rich Mediterranean diet reduces breast cancer risk, and it confirmed

findings from several previous population studies that the Mediterranean diet actually works.

So what does it take for a woman in her fifties to avoid breast cancer? Obviously, keeping meat consumption to a minimum, getting lots of fresh vegetables, and using olive oil for most cooking, baking and salad dressing is a good start. That alone would probably reduce her lifetime risk from about 8% to as low as 3%.

What we don't know is whether health care professionals are ready and willing to educate their patients and the public to act accordingly.

Source: Toledo E et al., Mediterranean Diet and Invasive Breast Cancer Risk Among Women at High Cardiovascular Risk in the PREDIMED Trial: A Randomized Clinical Trial. JAMA Int Med 2015 PMID 26365989



*A Mediterranean diet consists of a lot of fresh vegetables, fruits and whole grains, and may use olive oil as the main fat*

**TIP:**  
**High fructose intake  
 can make people  
 more salt-sensitive**

## Partners in crime: sugar and salt

High fructose intake is known to contribute to the development of hypertension, but questions about the underlying mechanism persist. Investigations in rodents now suggest that the sugar acts via uric acid, which in turn upregulates renal (pro)renin receptor (PRR). Stimulation of PRR makes salt sensitive by increasing expression of sodium/hydrogen exchanger 3 and Na/K/2Cl cotransporter expression and by activating the renin-angiotensin system.

The effect can be reversed by treatment with allopurinol. It is remarkable, but not surprising in light of what we already knew, that the effect on arterial blood pressure in this model was only seen when both fructose and sodium intake were high.

Source: Xu C et al. Activation of Renal (Pro) Renin Receptor Contributes to High Fructose-Induced Salt Sensitivity. Hypertension 2017; in press PMID 27993957

## Build stronger muscles with all kinds of protein

Higher muscle mass and greater muscle strength is not just what body builders and athletes want, it also ensures more robust health, important with advancing age.

Examination of food patterns and muscle health in middle-aged men and women found that higher protein intake went with greater muscle mass and strength. The differences were small overall (2-3%) and most of that between the lowest and the next protein intake quartile (medians 0.8 g/kg vs 1.1 g/kg). When participants were clustered by main protein sources, muscle measures were similar. It did not seem to matter whether protein came mainly from plant sources, or from meat, dairy products or fish.

These findings appear to support the notion that adults can sustain healthy and strong muscles with a plant-based diet just as well as with meats, fish or dairy products.

Source: Mangano KM et al. Dietary protein is associated with musculoskeletal health independent of dietary pattern. The Framingham Third Generation Family Study. Am J Clin Nutr 2017 In press PMID 28179224



*Adequate protein intake makes for better muscles at all ages, regardless of the foods it comes with.*



A 12oz. glass or can of cola comes with 39 g of table sugar (sucrose), about as much as ten sugar cubes.

## Why sugar is worse for some of us

The disaccharide sucrose (table sugar, saccharose) can only be absorbed from the small intestine after it is cleaved into its constituent monosaccharides glucose and fructose. Any undigested sucrose becomes a nutrient source for the microbes of the ileum, colon and rectum. Small amounts of undigested carbohydrates can act as a prebiotic stimulant of microbial growth. Larger amounts promote the development of gas and unpleasant or even harmful metabolites. Recent investigations demonstrated that functional variants in the gene jointly coding for sucrase and isomaltase are not rare. Combinations of two variants coding associated with low sucrase activity can be found in most populations, including in many people with Caucasian ancestry.

Carriers of low-activity sucrase variants were distinctly more likely to have irritable bowel syndrome (IBS) in several population studies. One of the more common low-activity sucrase variants, Val15Phe, was also associated with increased stool frequency, even in the absence of IBS, and greater abundance of Parabacteroides species in the feces. These findings might suggest that avoiding excessively high sucrose intake is a promising and practical strategy for variant carriers.

Sources: Cohen SA. The clinical consequences of sucrase-isomaltase deficiency. 2016;3(1):5 PMID:26857124

Henström et al., Functional variants in the sucrase-isomaltase gene associate with increased risk of irritable bowel syndrome. Gut 2016 Nov 21 (ahead of print) PMID 27872184

## Nutrient Highlight: L-Tryptophan (Trp)

The body uses L-tryptophan (Trp), an essential amino acid, not only for the synthesis of practically all peptides and proteins, but also as precursor of serotonin, melatonin, and nicotinamide. On average, about 1/60 of the ingested Trp is converted to nicotinamide, but efficiency of that conversion varies considerably between individuals. Since we

need Trp to make serotonin and melatonin, it cannot surprise that low intake has been linked to depression, anxiety and risk of suicide. Several studies found that we need Trp to enjoy the pleasantness of a gentle, loving touch.

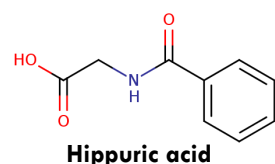
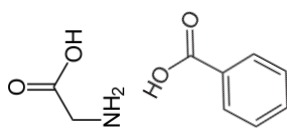
The protein in corn (maize) contains a particularly low percentage of Trp, only about half as much as milk protein.

Synthetic Trp supplements are deservedly disfavored because toxins in one particular product batch have caused severe illness and even death due to eosinophilia myalgia syndrome.

Sources: Amino acids and nitrogen compounds, in Nutrient Metabolism. M Kohlmeier, Acad Press, 2015

Trotter PD et al., Eur J Neurosci 2016 PMID 27307373

**Low excretion of N1-methylnicotinamide is a metabolic indicator of niacin deficiency and pellagra**



The amount of hippuric acid in urine increases with rising intake of phytochemical-rich foods, such as tea, cocoa, and vegetables.

## Inside Story: Metabolomics of black tea consumption

We often would like to know whether someone consumes particular food or beverage items and what happens to the bioactive ingredients after their intake. Analysis of small molecules in blood or urine can provide significant insights. This untargeted approach is called metabolomics.

Investigators have, for instance, compared the hundreds of different small molecules in urine after black tea consumption and after consumption of a placebo. They observed that black tea consumption increased the amounts of several distinctive metabolites including hippuric acid. This key metabolite forms in the liver when glycine is linked to benzoic acid in a detoxification reaction. The benzoic acid, in turn, comes from the action of gut bacteria on the polyphenols in black tea (*Camilla sinensis* leaves). By the way, benzoic acid is also a preservative in many beverages.

On a final note, benzoic acid and its metabolite hippuric acid also form upon exposure to some industrial phenolic toxins, such as toluene, so the context has to be taken into account.

Source: Van Velzen EJ et al. Phenotyping tea consumers by nutrikinetic analysis of polyphenolic end-metabolites. J Proteome Res 2009 PMID 19374449

## Nutrition In Medicine NEWS

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## ABOUT US

We are a team of nationally acclaimed educators and researchers who develop and maintain the NIM online curriculum for medical students, physicians and other healthcare professionals.

The NIM curriculum aims to teach evidence-based elements of nutrition physiology and clinical practice. Help us make it better!



Olive oil contains mostly monounsaturated fats and also comes with beneficial phytochemicals.

## Your Patients May Be Asking...

**Q:** I am concerned that I will have to get foods for the Mediterranean diet from specialty stores. What can I do to make it more affordable for me and my family?

**A:** You can get everything you need for making a Mediterranean diet at your usual grocery store or discounter.

First, remember that you can buy beans, peas, lentils, chickpeas, whole grains and other dry goods in bulk. You might want to check out special bargains and online sales. If properly stored, these staples keep for quite a while.

Second, whenever you really need to eat meat, buy a smaller amount of a better cut for a very special feast.

Lastly, search out a good basic virgin (first press) olive oil. Find one that fits your taste, needs and budget and make it your favorite after some experimenting. The flavors of olive oils can range from very mild to nutty to peppery notes. Some types of olive oil are good as general purpose fat, others are best for drizzling over breads, pasta or salads.

The higher price compared to vegetable oil (expect 2-3 times more) should be worth it in terms of taste and health benefits. You do not need the very expensive specialty and luxury brands. Look at the label to make sure you get cold pressed virgin olive oil.

Source: [oliveoiltimes.com/olive-oil-basics/mediterranean-diet-budget/53576](http://oliveoiltimes.com/olive-oil-basics/mediterranean-diet-budget/53576)