

ASN Publications

March 2016 Media Alert:
The Journal of Nutrition

The following articles are being published in the March 2016 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.

[Score one more win for broccoli - lowers risks of fatty liver and cancer in mice](#)

[Cleverly-controlled study finds dietary protein suppresses appetite more than do carbohydrates and fat](#)

[Fish oil consumption achievable from the diet lowers blood pressure, but only in hypertensive individuals](#)

[Score one more win for broccoli - lowers risks of fatty liver and cancer in mice](#)

Partly due to its year-round availability and apparent health benefits, broccoli is becoming one of the most widely consumed vegetables among Americans. In a study published in the March 2016 issue of *The Journal of Nutrition*, a research team at the University of Illinois led by Dr. Elizabeth Jeffery (an expert on bioactive compounds in foods) gives us one more reason to choose broccoli, and probably all of its cousins in the brassica family of vegetables, such as cabbage, cauliflower, and Brussels sprouts. Jeffery's newly published study suggests that consuming broccoli on a daily basis might decrease the development of fatty liver and liver cancer, even when an unhealthy diet is consumed. Well, at least, this is what they discovered in laboratory mice given the carcinogen diethylnitrosamine and fed experimental diets that model the typical diet eaten by many overweight Americans today.

More specifically, the researchers studied 12 different groups of mice, each receiving broccoli or no broccoli; diethylnitrosamine or no carcinogen; and a high-fat, high-sugar "Westernized" diet or one with a more balanced nutrient portfolio. Treatments lasted 6 months, a relatively long time for a mouse, since mice only live to be about 2 years old. At the end of the study, the mice's blood and livers were evaluated for a variety of factors including various lipids and indications of cancer.

Upcoming Events

April 2-6. [ASN Scientific Sessions and Annual Meeting](#) at Experimental Biology. San Diego, CA. Free passes for media!

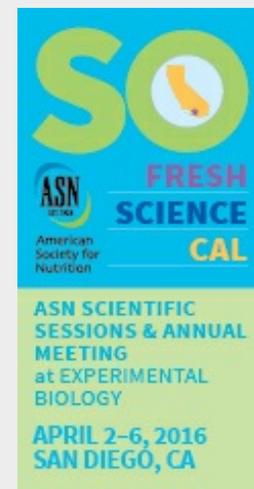
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Results showed that broccoli-eating mice had lower liver triglycerides and overall fatty liver scores than their non-broccoli-eating counterparts. Broccoli consumption also benefitted the immune system and slowed liver cancer progression. Whereas consumption of the Westernized diet led to fatty liver and increased cancer risk, when mice ate broccoli along with this unhealthy diet, they were protected from these negative outcomes. The researchers concluded "In this age when obesity is such a problem, including broccoli in the diet may have significant public health implications for maintenance of a healthy liver, particularly in those who are greatly overweight." Score one more for broccoli!

Reference Chen Y-J, Wallig MA, Jeffery EH. Dietary broccoli ameliorates development of fatty liver and cancer in mice given diethylnitrosamine with or without a Western diet. *Journal of Nutrition* 146:542-60.

For More Information To contact the corresponding author, Dr. Elizabeth Jeffery, please send an e-mail to ejeffery@illinois.edu

Cleverly-controlled study finds dietary protein suppresses appetite more than do carbohydrates and fat

Have you ever wondered if your choice of foods affects how much you eat and how quickly you get full? For instance, does it make a difference if you begin your day with a piece of carbohydrate-rich toast or a slice of cheese in terms of how much you end up eating at breakfast and lunch? These questions are, indeed, important in this era of burgeoning obesity and all of its associated health problems. Currently, urban legend suggest that high-protein foods are the most satiating, and high-carbohydrate choices the least. But not all research supports this contention, possibly due to differences in experimental design or subjects' characteristics. For instance, men might respond differently than women. In addition, many studies have not systematically controlled for important dietary variables, like calories, that might make results difficult to interpret and compare. To help fill this research gap, Drs. Anestis Dougkas and Elin Östman from Lund University (Sweden) conducted a carefully-controlled dietary intervention study with 23 men and 17 women. Their study is published in the March 2016 issue of *The Journal of Nutrition* and summarized here.

To be eligible for the study, individuals needed to be between 20 and 50 years old, healthy, nonvegetarian, not on a diet, and have a positive relationship with food (as assessed by a commonly-used questionnaire). Each subject then agreed to report to the metabolic laboratory on several mornings, each time after consuming a standard meal the night before. During each of these visits, participants consumed an experimental beverage containing a specific amount of protein, carbohydrate, and fat; all treatments provided the same level of calories and were consumed in equal volumes. Several hours later, subjects were offered a lunch meal of tortellini with tomato sauce and cheese and asked to consume as much as they liked. The researchers then investigated how each "preload" beverage influenced feelings of fullness, subsequent lunch consumption, and blood levels of several hormones and metabolites

Data clearly show that, regardless of the preload beverage's fat and carbohydrate contents, consuming a high-protein version suppressed appetite the most. Consuming the high-protein treatment also lowered blood glucose and raised glucagon-like peptide 1 concentrations. This is

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especially interesting because glucagon-like peptide 1 is known to suppress appetite. These effects were generally opposite for the high-fat preload (suggesting that consuming fatty foods impact appetite less than protein and carbohydrate) and the same in men and women. Although there were no differences in the amount of food consumed at lunch, the researchers concluded that "adjusting the nutritional profile of a meal, especially replacing fat with protein, could make dieting more endurable."

Reference Dougkas A, Östman E. Protein-enriched liquid preloads varying in macronutrient content modulate appetite and appetite-regulating hormones in healthy adults. *Journal of Nutrition* 146:63745.

For More Information To contact the corresponding author, Dr. Anestis Dougkas, please send an e-mail to anestis.dougkas@food-health-science.lu.se.

Fish oil consumption achievable from the diet lowers blood pressure, but only in hypertensive individuals

With cardiovascular disease topping our nation's most prevalent causes of death, researchers continue to search for ways to decrease risk for heart disease and stroke. One such approach that has received substantial endorsement is increasing consumption of the fats (technically referred to as long-chain omega-3 fatty acids) found in some oily fish such as tuna and salmon and in fish oil supplements. Most dietary guidance documents recommend that healthy people strive to consume, on average, at least 0.5 gram of these fats each day, or 3.5 grams each week. People with already-established cardiovascular disease are advised to consume twice this amount. To put these values into perspective, a 3-ounce serving of Atlantic farmed salmon contains about 2 grams of omega-3 fatty acids. Unfortunately, most of the published studies on this topic have used dosages of at least 3 grams per day (21 grams per week) of omega-3 fatty acids - substantially higher than what can be typically consumed from foods. To determine if individuals can also benefit from eating reasonable amounts of these health-promoting fats, intakes which could be achieved from a normal diet, a research team led by Dr. Anne Marie Minihane (University of East Anglia, UK) evaluated what happens to blood pressure when healthy men and women consume supplements with moderate amounts of omega-3 fats, which could be achieved through incorporating oily fish into the diet a few times a week. You can read more about their study in the March, 2016 issue of *The Journal of Nutrition*.

To complete the study, each participant agreed to consume either control oil supplements made from palm oil and soybean oil or supplements providing 0.7 or 1.8 grams of long-chain omega-3 fatty acids each for 8 weeks. Order of treatment was randomized, and neither subjects nor investigators knew which treatment was being imposed during each study period. At the beginning and end of each study period, blood pressure was carefully assessed along with other markers of cardiovascular health. The researchers also investigated whether a person's response to treatment depended on genotype, baseline omega-3 status, or whether they were male or female.

Results indicated that consuming fish oil supplements reduced systolic blood pressure, but only in participants who had systolic hypertension at the beginning of the study. Both doses of fish oil were effective in this regard.

The researchers urge additional studies designed to understand the physiologic mechanisms by which fish oil has this beneficial effect in these at-risk, but often untreated, individuals.

Reference Minihane AM, Armah CK, Miles EA, Madden JM, Clark AB, Caslake MJ, Packard CJ, Kofler BM, Lietz G, Curtis PJ, Mathers JC, Williams CM, Calder PC. Consumption of fish oil providing amounts of eicosapentaenoic acid and docosahexaenoic acid that can be obtained from the diet reduces blood pressure in adults with systolic hypertension: A retrospective analysis. *Journal of Nutrition* 146:516-23.

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