



July 2015 Media Alert: *The Journal of Nutrition*

The following articles are being published in the July 2015 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.

[Protein intake, particularly from animal-source foods, related to muscle mass in middle-aged adults](#)

[Vitamin B-12 deficiency in children linked to more repeated grades and missed school days](#)

[High-protein pudding snacks may help control appetite in healthy teens](#)

[Protein intake, particularly from animal-source foods, related to muscle mass in middle-aged adults](#)

Americans are living longer than ever, and although this is generally good news it also means that today's healthcare challenges are shifting. For instance, because we tend to lose muscle mass, strength, and coordination as we age, risk of falls is increasing. The US Centers for Disease Control and Prevention (CDC) estimates that nearly one-third of older adults fall each year and that falling is the leading cause of injuries in the elderly. Consequently, finding ways to prevent the loss of strength and coordination that comes with aging has significant public health ramifications. Both common sense and research suggests that consuming adequate amounts of protein in later life coupled with physical activity might be one way to stave off muscle loss. However, little is known about whether getting adequate dietary protein in mid-life might also help in this regard. To help fill this knowledge gap, Dr. Shivani Sahni and colleagues at Hebrew SeniorLife and Harvard Medical School evaluated the relationships between dietary protein intake from animal and plant sources and leg muscle mass and strength in a relatively large cohort of middle-aged men and women. Their results are published in the July 2015 issue of *The Journal of Nutrition*.

The data evaluated by Sahni and coworkers were drawn from the Framingham Offspring Study, a follow-up study to the famous Framingham Heart Study originally initiated in 1948 to identify factors that might contribute to cardiovascular disease. In 1971, the children of the original participants were enrolled in what was called the "offspring cohort," and ~2,600 of them (average age of 60 years) were the focus of Sahni's work. All participants completed a detailed dietary intake questionnaire and had their body composition and quadriceps strength measured. The researchers then used sophisticated mathematical modeling to assess the relationships of interest.

Their analyses show that participants who consumed the most protein had

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the most muscle in their legs - this relationship was driven by animal-source (not plant-source) protein. Muscle strength, however, was statistically related more to plant than animal protein. The authors concluded that "maintaining adequate protein intakes with aging may help preserve muscle mass and strength in adult men and women." Whether plant protein intake actually influences muscle strength or is just an indicator of overall dietary quality, however, needs further clarification.

Reference Sahni S, Mangano KM, Hannan MT, Kiel DP, McLean RR. Association of protein intake with lean mass and quadriceps muscle strength in adult men and women. *Journal of Nutrition* 145:1569-75, 2015.
For More Information To contact the corresponding author, Dr. Sahni, please send an e-mail to ShivaniSahni@hsl.harvard.edu.

Vitamin B-12 deficiency in children linked to more repeated grades and missed school days

There are 13 essential vitamins that we must get from foods because our bodies cannot make them or at least cannot make enough to keep us healthy. Vitamin B-12 (technically referred to as *cobalamin*) is one of these nutrients. In fact, vitamin B-12 is found only in animal-source foods such as meat, poultry, fish, dairy products, and eggs. Vitamin B-12 deficiency has long been linked with anemia and, when it occurs in the elderly, dementia. However, a growing body of literature suggests that this vitamin is involved in many more important functions in the body - perhaps lowering risks for birth defects, cardiovascular disease, osteoporosis, and depression. In a study published in the July 2015 edition of *The Journal of Nutrition*, a research team led by Dr. Eduardo Villamor (University of Michigan) reports the results of a study they undertook to test their hypothesis that vitamin B-12 deficiency might be associated with indicators of poor academic success in school-aged children.

This study took place in Colombia as part of the Bogota School Children Cohort which was initiated in 2006 to study the relationship between nutrition and health in children who were 5-12 years old at the time of enrollment. The study included 3154 children recruited from public schools and who agreed to provide a small blood sample which was analyzed for biomarkers of iron, zinc, vitamin A, vitamin B-12, and folate status. One year later, school records were used to determine which children successfully completed the grade in which they had been enrolled and how many days each child was absent from school.

Children who were vitamin B-12 deficient were nearly 2 and a half times more likely to have failed the grade they were in compared to those with adequate vitamin B-12 status. Similar trends were found for absenteeism. Whereas none of the other vitamins and minerals considered appeared to be associated with grade repetition, anemia (a complex consequence of many nutritional factors) was a common characteristic of children who had missed the most school during the study. The researchers concluded that, because their study cannot be used to assess causality, the effects of correcting vitamin B-12 deficiency on educational outcomes need to be determined using a controlled dietary intervention study.

Reference Duong M-C, Mora-Plazas M, Marin C, Villamor E. Vitamin B-12 deficiency in children is associated with grade repetition and school absenteeism, independent of folate, iron, zinc, or vitamin A status biomarkers. *Journal of Nutrition* 145: 1541-8, 2015.
For More Information To contact the corresponding author, Dr. Eduardo Villamor, please send an e-mail to villamor@umich.edu.

High-protein pudding snacks may help control appetite in healthy teens

Snacking appears to be a veritable double-edged sword when it comes to weight management. On one hand, some people (mostly those with healthy body weight) seem to benefit from snacking throughout the day. For others

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Suzanne Price
Communications & Media
Director
9650 Rockville Pike
Bethesda, MD 20814
media@nutrition.org
301-634-7235

(often those who are overweight), snacking represents yet another source of calories leading to weight gain. Although this may initially seem inconsistent, the difference probably lies in the types and amounts of snacks people choose to eat. Supporting this possibility are several studies showing that healthy-weight individuals tend to choose snacks high in protein, essential micronutrients, and fiber; whereas overweight and obese individuals are more likely to reach for high-fat, high-sugar options. As such, whether snacking maintains or increases body weight is probably influenced by an interaction between a person's body weight and their food preferences. To help understand this complex situation, and in particular how it might apply to teenagers, a research group headed by Dr. Heather Leidy at the University of Missouri studied the effects of consuming different types of afternoon snacks on appetite and satiety. Their results are published in the July 2015 issue of *The Journal of Nutrition*.

This study utilized the "gold standard" of nutrition research: a randomized, controlled, cross-over experiment. In a nutshell, 31 healthy teens (mean age: 17 years) agreed to participate in 3 treatment periods, each lasting 4 days. During one of the periods, they consumed no afternoon snack. In the others, they consumed either a high-protein chocolate-peanut-caramel-flavored pudding or the same amount of a high-fat (low-protein) version containing a similar number of calories (~250 kcal). The protein source for each pudding was derived from soybeans. On the 4th day of each treatment period, subjects participated in an 8-hour study during which appetite and food consumption were assessed.

Although both types of puddings reduced appetite (compared to when no snack was consumed), the high-protein pudding was more effective in this regard than its high-fat counterpart. In addition, when participants consumed the high-protein pudding in the afternoon, their subsequent drive to eat was lessened. Furthermore, they chose, by their own accord, to indulge in fewer high-fat/high-sugar snacks later in the evening. These results support the possibility that snacking on relatively high-protein foods in the afternoon might help maintain a healthy weight. Further research exploring underlying mechanisms is needed.

Reference Leidy HJ, Todd CB, Zino AZ, Immel JE, Mukherjea R, Shafer RS, Ortinau LC, Braun M. Consuming high-protein soy snacks affects appetite control, satiety, and diet quality in young people and influences select aspects of mood and cognition. *Journal of Nutrition* 145: 1614-22, 2015.

For More Information To contact the corresponding author, Dr. Heather Leidy, please send an e-mail to leidyh@health.missouri.edu.

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