December 2012 Media Alert: *The Journal of Nutrition*

The following articles are being published in the December 2012 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.

Danish researchers find possible unhealthy relation between milk consumption and weight gain in overweight teens

Scientists conclude current recommendations for vitamin E might be too high

New study suggests that consuming a Mediterranean-style diet may be linked to lower frailty in the elderly

Danish researchers find possible unhealthy relation between milk consumption and weight gain in overweight teens

With international obesity prevalence increasing in both developed and developing nations, researchers continue to ask whether shifts in food consumption patterns might be to blame. For instance, does it matter what proportion of calories comes from high-protein vs. high-carbohydrate foods? Indeed, some studies have shown that increased protein intake might be beneficial in both preventing weight gain and assisting in weight loss. Among the types of protein-rich foods thought to be most beneficial in this regard are dairy products, which not only provide complete proteins but also calcium and a variety of other essential micronutrients important for optimal health. Milk proteins can be further categorized as being either whey or casein depending on whether they form curds when exposed to acid, and some studies suggest that the effect of milk consumption on body weight may depend on whether whey or casein proteins are consumed. In a study published in the December 2012 issue of *The Journal of Nutrition*, Danish researchers, however, report their findings that consumption of dairy products *increases* body weight in teens - regardless of its protein type.

A total of 173 overweight/obese (body mass index > 25 kg/m^2) teens (12-15 years of age) were randomized to drink 1 liter/day of one of 3 test drinks for 12 weeks: skim milk, whey, casein, or water. The 3 milk-based drinks all contained 35 grams protein and 330-380 kcal per liter; however, the skim milk beverage contained more fat, phosphorus, and calcium than the others. Subjects were asked to maintain their usual meal and activity patterns. Body weight and height were measured 12 weeks before the experiment began (baseline), and at the beginning and end of the study. Blood samples were drawn and analyzed for insulin, glucose, and C-peptide (a biomarker of insulin synthesis and type 2 diabetes risk).

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After controlling for what would be considered healthy weight gain for teens during the 12-week study period, the researchers found that whereas subjects consuming water did not gain extra weight those consuming the milk-based products did. In addition, circulating levels of C-peptide increased for participants in the whey and casein groups, but not the water and skim milk groups. The researchers concluded that "high intakes of skim milk, whey, and casein increase weight gain in overweight adolescents and that whey and casein increase insulin secretion." They consequently urge further studies designed to unravel the complex physiological links among these important health parameters, especially in this especially vulnerable population with high growth velocity during puberty. Furthermore, the effect on body composition and not only weight should be considered.

Reference Arnberg K, Mølgaard C, Michaelsen KF, Jensen SM, Trolle E, Larnkjær A. Skim milk, whey, and casein increase body weight and whey and casein increase the plasma C-peptide concentration in overweight adolescents *Journal of Nutrition* 142:2081-2088, 2012.
For More Information To contact the author Dr. Christian Mølgaard, please send an e-mail to cm@life.ku.dk.

Scientists conclude current recommendations for vitamin E might be too high

Vitamin E, also called a-tocopherol, is an essential nutrient that helps protect cells from oxidative damage thus potentially decreasing risks for a variety of serious conditions such as cancer and cardiovascular disease. Considered a "fat-soluble" vitamin, vitamin E is found naturally in a diversity of foods such as tomatoes, almonds, spinach, and sunflower seeds. It is also frequently added to "fortified" foods. Vitamin E deficiency is exceedingly uncommon, but when it happens results in ruptured red blood cells, weakness, and fatigue. In 2000, the Institute of Medicine established a Recommended Dietary Allowance (RDA) for this vitamin of 15 mg (35 µmol)/day for men and women. This value was based on rather sparse evidence that the typical healthy adult needs 12 mg (28 µmol), and that the higher RDA intake level would protect the vast majority (~97%) of individuals from developing vitamin E deficiency. In a study published in the December 2012 issue of *The Journal of Nutrition*, however, researchers suggest that this recommended intake may be higher than needed.

To help establish more accurate recommendations for vitamin E intake, the research team conducted a classic "balance study" in which they followed what happened to vitamin E after it was ingested by 6 healthy men and 6 healthy women (mean age: 27 years). This was accomplished by having the subjects consume a small amount of stably-labeled (nonradioactive) vitamin E and then collecting and analyzing blood for 70 days as well as urine and feces for 21 days. Using somewhat sophisticated statistical methods, the scientists were then able to construct a 17-component model predicting how dietary vitamin E gets partitioned among various tissues and organs in the body. From this, they were able to estimate bioavailability (% absorption) of vitamin E and likely average requirements.

The researchers found that a daily intake of 4 mg (9.2 µmol) was generally sufficient to maintain healthy circulating levels of vitamin E. This is the amount in approximately 1/3 cup of tomatoes or 2 tablespoons of sunflower seeds. As this value is 3-times lower than that (12 mg; 28.6 µmol) estimated previously by the Institute of Medicine, the scientists

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recommend re-evaluation of current intake goals for this vitamin. Clearly, what we know about optimal nutrition continues to evolve as more savvy research is conducted.

Reference Novotny JA, Fadel JG, Holstege DM, Furr HC, Clifford AJ. This kinetic, bioavailability, and metabolism study of *RRR*-a-tocopherol in healthy adults suggests lower intake requirements than previous estimates. *Journal of Nutrition* 142:2103-2109, 2012.
For More Information To contact the corresponding author, Dr. Andrew Clifford, please send an e-mail to ajclifford@ucdavis.edu

New study suggests that consuming a Mediterranean-style diet may be linked to lower frailty in the elderly

The US Department of Health and Human Services estimates that approximately 40 million US Americans are 65 years or older. This represents 13% of the US population, or about one in every eight Americans. Importantly, by 2030 the number of older Americans is expected to reach 72 million-not only increasing the incidence of age-related health problems but also presenting a growing financial burden on individuals, families, and society. Results from many studies have shown that the elderly are at increased risk for dietary deficiencies, such as those related to poor iron and protein consumption, and that improved nutrient intake can sometimes improve their health. However, very little is known about how overall dietary *patterns* are related to wellbeing in this age group. In a study published in the December 2012 issue of *The Journal of Nutrition*, an international research team headed by Dr. Sameera Talegawkar (Johns Hopkins Bloomberg School of Public Health) and supported by the Johns Hopkins Older Americans Independence Center report that consuming a "Mediterranean-style" diet might be helpful in this regard.

This study was conducted as part of the InCHIANTI study, a large epidemiologic (observational) investigation carried out in the Tuscany region of Italy from 1998 until 2006. Researchers recruited elderly men and women (65+ years of age) and asked them to complete questionnaires assessing how closely their diets matched those traditionally consumed in regions surrounding the Mediterranean. A score of 0 to 9 was assigned to each person's diet, reflecting minimal to maximal adherence, respectively. In general, higher scores reflected higher fruit, vegetable, legume, cereal, fish, and monounsaturated fat intakes as well as moderate alcohol consumption. Frailty (a syndrome of age-associated physiological decline conferring high vulnerability to stressors) was assessed at the beginning of the study and at least one other time during the study period.

The researchers found that individuals consuming diets most in line with the traditional Mediterranean-style food pattern were 70% less likely to develop frailty during the study than those consuming diets least resembling Mediterranean patterns. However, since the study was observational in nature, one cannot conclusively say whether a Mediterranean-style diet is protective against frailty. Indeed, dietary intakes in the cohort were assessed when participants were 65+ years, and factors like muscle strength and muscle mass attain their peaks earlier in life. Nonetheless, this study supports many others that show a relationship between consuming a nutrient-rich, balanced diet and overall health across the lifespan.

Reference Talegawkar SA, Bandinelli S, Bandeen-Roche K, Chen P, Milaneschi Y, Tanaka T, Semba RD, Guralnik JM, Ferrucci L. A higher adherence to a Mediterranean-style diet is inversely associated with the development of frailty in community-dwelling elderly men and women. *Journal of Nutrition* 142:2159-2164, 2012.
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