
**November 2014 Media Alert:**
***The Journal of Nutrition***

The following articles are being published in the November 2014 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.

**Extra choline during pregnancy may offset memory loss caused by early iron deficiency in offspring**

**Greater dietary diversity in first year of life related to enhanced growth during second year of life**

**Controlled clinical study: leucine especially beneficial after exercise in elderly**

**Extra choline during pregnancy may offset memory loss caused by early iron deficiency in offspring**
A growing number of studies strongly support the concept that early-life nutrition (even that which occurs *in utero*) can have long-lasting impacts on both physical and psychological health and wellbeing. For instance, iron deficiency in infancy can lead to poor cognitive abilities and social skills in adulthood. Some of these outcomes cannot be reversed with later iron supplementation, so prevention is critical. Another nutrient thought to be fundamentally important in very early life is choline which is found in a wide variety of foods such as egg yolks, salmon, quinoa, chicken, and milk. Because choline is a building block for brain, obtaining adequate amounts during infancy and childhood when neural development is at its peak is important for mental health. In fact, choline supplementation can sometimes reverse some of the cognitive deficits observed in mouse and rat models of conditions such as fetal alcohol syndrome and Down syndrome. Recently, researchers from the University of Minnesota asked whether choline supplementation might also help dampen the negative cognitive effects of early iron deficiency in rats. Details about their study and its promising results are published in the November 2014 issue of *The Journal of Nutrition*.

To understand whether iron and choline nutrition might interact in early life, the researchers fed pregnant laboratory rats either an iron-rich or iron-deficient diet with or without additional choline from the beginning of pregnancy through the first week postpartum. After this time all animals (mothers and offspring) were fed regular rat chow with adequate amounts of iron but no added choline. Various measurements of nutritional status and neural development (including recognition memory and social interest) were then tested in the offspring when they were young adults.

As expected, early iron deficiency caused rats to have poor recognition memory and lower production of important brain chemicals. This effect,

## Upcoming Events

**December 4-6.**
Advances & Controversies in Clinical Nutrition.
National Harbor, MD.
*Media are invited to attend all or part of the conference.* Email us: media@nutrition.org

## Journal Links

The American Journal of Clinical Nutrition

The Journal of Nutrition

Advances in Nutrition

Nutrition Today is a partner publication of ASN.

**Follow ASN (@nutritionorg) on Twitter for scientific studies, nutrition news, and special offers.**

## Media Requests

To arrange an interview with an ASN Spokesperson, please email media@nutrition.org

Archive of Press Releases

however, was prevented in animals whose mothers' diets had been supplemented with choline during pregnancy. However, deficits in social behaviors caused by iron deficiency were not prevented via dietary choline fortification. The authors concluded "prenatal choline supplementation may be a promising adjunct treatment for fetal-neonatal iron deficiency." Of course, controlled human studies will be needed to test this possibility.

**Reference** Kennedy BC, Dimova JG, Siddappa AJM, Tran PV, Gewirtz JC, Georgieff MK. Prenatal choline supplementation ameliorates the long-term neurobehavioral effects of fetal-neonatal iron deficiency in rats. *Journal of Nutrition* 144: 1858-1865, 2014.
**For More Information** To contact the corresponding author, Bruce Kennedy, please send an e-mail to Kenne379@umn.edu.

**Greater dietary diversity in first year of life related to enhanced growth during second year of life**

Malnutrition, especially in infants and children, remains one of the most critical health challenges facing the world today. Indeed, experts estimate that better nutrition might prevent more than 3 million infant and child deaths annually around the globe. In response, the World Health Organization has published a series of recommendations related to optimal feeding practices during early life along with a complementary set of benchmarks (indicators) that can be used to assess adequacy of overall feeding practices. For instance, feeding a diverse diet to children is recommended to meet vitamin and mineral needs, and "dietary diversity" can be assessed by recording the number of different food groups (e.g., grains, legumes/nuts, dairy products, etc.) that are consumed. Although some studies have linked adherence to these dietary indicators with better child growth, existing data are somewhat weak because studies have not typically tracked dietary patterns and growth in the same children over time. Without these types of longitudinal studies, it is difficult to confidently say that variation in the dietary indicators is actually associated with differences in subsequent growth. To help fill this research gap, scientists from the University of Otago (New Zealand), London School of Hygiene and Tropical Medicine, King's College School of Medicine (UK), and the University Teaching Hospital in Lusaka (Zambia) analyzed dietary and growth data simultaneously collected over 1 year in a Zambian cohort of infants. The study is published in the November 2014 issue of *The Journal of Nutrition*.

The researchers were specifically interested in studying the relationships among dietary diversity, socioeconomic status of the family, and growth adequacy of children between 6 and 18 months old. During this time, infant weight and length were repeatedly measured and several dietary indicators (including diversity, meal frequency, and consumption of iron-rich foods) were assessed. Socioeconomic status was based on such factors as home ownership, sanitation facilities, floor type, water source, and electricity. In all, a total of 811 infants were evaluated.

Several variables measured at 6 months were found to be associated with child growth at 18 months of age. For instance, consumption of iron-rich



## Advertise with ASN

Advertising opportunities with ASN include the ASN monthly e-newsletter, medical nutrition e-newsletter, on-site convention newspaper, and job board. Visit our advertising page to learn about all available opportunities to reach our membership.

## Contact ASN

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

foods and higher dietary diversity were associated with increased weight and height, and greater household wealth and maternal education were related to increased height. Increased dietary diversity at 6 months seemed to explain a relatively large portion of the effect of maternal education on both height and weight at 18 months. The researchers concluded that child feeding programs should be "targeted toward the early period of complementary food introduction, and policies aimed at increasing formal maternal education may benefit child growth through improved feeding practices."

**Reference** Mallard SR, Houghton LA, Filteau S, Mullen A, Nieuwelink J, Chisenga M, Siame J, Gibson RS. Dietary diversity at 6 months of age is associated with subsequent growth and mediates the effect of maternal education on infant growth in urban Zambia. *Journal of Nutrition* 144: 1818-1825, 2014.
**For More Information** To contact the corresponding author, Simonette Mallard, please send an e-mail to simonette.mallard@otago.ac.nz.

**Controlled clinical study: leucine especially beneficial after exercise in elderly**

Protein powders, protein shakes, and high-protein bars are all mainstays of many athletes and body builders. Even young athletes are encouraged to reach for protein-rich dairy products after a workout or game. But what about the elderly? Might consuming a good source of protein immediately after exercise also help them maintain or even increase their muscle mass and/or strength? Current research, like that published in the November 2014 issue of *The Journal of Nutrition*, suggests that the answer to this question is "yes" and that the amino acid leucine (a building block of protein) may be especially important in this regard. This type of research has important public health implications because one factor related to frailty and increased risk for accidents and other age-related complications is loss of muscle mass and function - a condition referred to as *sarcopenia*. For this reason, experts recommend that all ages engage in both aerobic and resistance (strengthening) exercises. For instance, the US Department of Health and Human Services recommends that adults participate in at least 2½ hours of moderate-intensity aerobic activity weekly and muscle-strengthening activities at least twice each week. Dr. Jared Dickinson (formerly of the University of Texas Medical Branch, Galveston, now with Arizona State University) and his team tested in their study whether consuming a leucine-enriched protein beverage shortly after resistance exercise might offer additional muscle-strengthening benefits in older individuals.

This study involved 15 healthy, older men (mean age 72 years) who were considered recreationally active but who did not participate regularly in any type of scheduled exercise program. After eating a standardized evening meal and late-night snack, the participants spent the night in the university's Clinical Research Center. The following morning, they were infused with very small amounts of stable (nonradioactive) versions of 2 amino acids so that the scientists could precisely evaluate muscle metabolism. They were then asked to participate in a standard exercise activity involving leg strengthening. One hour after the exercise, 7 of the men consumed an essential amino acid containing beverage that provided a standard level of leucine whereas the remaining 8 consumed a similar beverage with twice the level of leucine. Blood samples and muscle biopsies were obtained to determine whether and how the different amounts of leucine influenced post-exercise muscle metabolism.

The researchers uncovered several benefits of the higher level of leucine. For instance, although each beverage stimulated muscle protein synthesis 2-5 hours after exercise, only in the men who had consumed more leucine was this effect still seen 24 hours later. The researchers concluded "consumption of leucine-enriched protein after resistance exercise may prolong the anabolic response and sensitivity of skeletal muscle to amino acids in older adults."

**Reference** Dickinson JM, Gundermann DM, Walker DK, Reidy PT, Borack

MS, Drummond MJ, Arora M, Volpi E, Rasmussen BB. Leucine-enriched amino acid ingestion after resistance exercise prolongs myofibrillar protein synthesis and amino acid transporter expression in older men. *Journal of Nutrition* 144: 1694-1702, 2014.

**For More Information** To contact the corresponding author, Dr. Jared Dickinson, please send an e-mail to jared.dickinson@asu.edu.

*ASN is the authoritative voice on nutrition and publisher of* The American Journal of Clinical Nutrition, The Journal of Nutrition, *and* Advances in Nutrition. *Established in 1928, ASN's more than 5,000 members in more than 75 countries work in academia, practice, government and industry. ASN advances excellence in nutrition research and practice through its publications, education, public affairs and membership programs. Visit us at www.nutrition.org.*



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