

ASN Publications

April 2012 Media Alert: *The Journal of Nutrition*

The following articles are being published in the April 2012 issue of *The Journal of Nutrition (JN)*, 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.

[Resistant starch derived from corn improves insulin sensitivity in overweight and obese men](#)

[Iodine deficiency decreasing globally, increasing locally - continued public health vigilance prudent](#)

[Malnutrition during first year of life increases risk for attention deficits in adults](#)

Resistant starch derived from corn improves insulin sensitivity in overweight and obese men

The hormone *insulin*, released from the pancreas in response to eating, enhances the movement of glucose from the blood into cells - thus playing a critical role in maintaining healthy blood sugar levels. However, some people do not respond appropriately to insulin and therefore have chronically elevated insulin and/or blood sugar concentrations. These "insulin-resistant" individuals, many of whom are overweight or obese, are especially prone to development of type 2 diabetes and cardiovascular disease. Thus, finding ways to help regain insulin sensitivity may improve the health of those with insulin resistance. A group of promising dietary components shown in some studies to increase insulin sensitivity are collectively referred to as *resistant starches*. These complex carbohydrates cannot be fully digested in the small intestine, and therefore enter the bowel where they can be metabolized by the microorganisms residing there. Typical Americans consume < 5 grams/day of naturally-occurring resistant starches from foods such as breads, cereals, pastas, and vegetables, whereas levels thought to confer health benefits are in the realm of > 20 grams/day. Consequently, food manufacturers are interested in whether additional resistant starches can be added to foods to improve human health. In a study published in the April 2012 issue of *The Journal of Nutrition*, researchers report the results they observed when they tested the physiologic effects of 2 levels of intake of a corn-derived resistant starch (HAM-RS2) in overweight and obese individuals with elevated risk for cardiovascular disease.

The study consisted of three 4-week treatment periods separated by 3-week "washout" periods during which time no treatments were administered. Thirty-three otherwise healthy men and women (mean age: 50 years) were recruited from the Chicago area. To be eligible to be in the study, individuals had to have large waist circumferences but not extreme obesity. During the treatment periods, subjects consumed either 0, 15, or 30 grams/day of the

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experimental starch. Each participant experienced each treatment, and neither the study personnel nor the subjects knew which order they were consuming the treatments - making this a double-blind, crossover study. Insulin sensitivity was assessed using intravenous glucose tolerance tests. Blood lipid profiles were also evaluated.

The results revealed that consuming either 15 or 30 grams/day of the HAM-RS2 enhanced insulin sensitivity in men, but there was no such effect in women. There were no effects on blood lipid levels in either gender. The researchers concluded that consumption of this product at levels of at least 15 grams/day improves insulin sensitivity in overweight and obese men and urge additional studies to help to further understand the mechanisms responsible for this effect and to explain why women did not respond similarly.

Reference Maki KC, Pelkman CL, Finocchiaro ET, Kelley KM, Lawless AL, Schild AL, Rains TM. Resistant starch from high-amylose maize increases insulin sensitivity in overweight and obese men. *Journal of Nutrition* 142:717-723, 2012.

For More Information To contact the corresponding author, Dr. Kevin Maki, please send an e-mail to KMaki@ProvidentCRC.com.

Iodine deficiency decreasing globally, increasing locally - continued public health vigilance prudent

Because human health depends in part on adequate consumption of iodine from the foods and beverages we consume, iodine is an essential dietary mineral. Indeed, iodine is a critical component of the thyroid hormones that are needed to modulate growth, development, and energy metabolism, and iodine deficiency can have serious long-lasting consequences. Prior to the fortification of salt with iodine in the 1920s, iodine deficiency was a major public health problem in some regions of the United States, and the use of iodized salt is credited with nearly eliminating iodine deficiency in many countries worldwide. But despite efforts to introduce iodized salt internationally, there is on-going concern about iodine deficiency around the world. To help document the prevalence of iodine deficiency worldwide, researchers from the Swiss Federal Institute of Technology Zurich and the International Council for the Control of Iodine Deficiency Disorders used newly published data to investigate international trends in iodine status over the past decade. Their results can be found in the April 2012 issue of *The Journal of Nutrition*.

Data used for this analysis were the most recent data collected in the 193 World Health Organization (WHO) member states as well as WHO's six "regions" (e.g., Africa, Europe, etc.). Data were gleaned from the WHO database on iodine deficiency, research papers published in peer-reviewed journals, and survey reports. More specifically, the researchers used data summarizing urinary iodine concentrations of school-aged children to describe overall iodine status in each country, with low and high levels indicative of iodine deficiency and high iodine intakes, respectively. Iodine can easily be measured in the urine, and median urinary iodine concentration of school-aged children is commonly considered a proxy measure of the iodine status of the entire population.

The results indicate that there have been major improvements in iodine nutrition worldwide over the past decade: the number of iodine-deficient countries decreased from 54 to 32, and the number of countries with adequate iodine intake increased from 67 to 105. However, approximately 241 million school-aged children and 1.9 billion people (all ages) are still estimated to have low iodine intakes. Iodine deficiency was clearly not unique to developing regions. For example, the researchers estimated that 44% of Europeans (393 million people) may be consuming inadequate levels, and southeast Asia was found to have over 540 million individuals with low intakes. About 14% of children in the American region (~15 million children) were categorized with low intakes - a number slightly higher than the

estimate for 2003. The authors concluded that, although iodine nutrition has been improving internationally since 2003, global progress may be slowing and additional intervention programs are needed.

Reference Andersson M, Karumbunathan V, Zimmermann MB. Global iodine status in 2011 and trends over the past decade. *Journal of Nutrition* 142:744-750, 2012.

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Malnutrition during first year of life increases risk for attention deficits in adults

Experts unanimously agree that good nutrition throughout the life cycle is important for optimal health. This may be especially true during very early life, when poor nutrition can lead to immediate illness and even death. Researchers have long known that early malnutrition can also result in long-term deficits in both physical and cognitive health. For instance, individuals who were born during the war-time Dutch famine (thus, having experienced prenatal malnutrition) exhibited greater than expected rates of schizophrenia, antisocial behaviors, and affective disorders when they were young adults. Whether malnutrition occurring during early infancy has lasting effects on behavior and cognition, however, is less well understood. In response, researchers from Harvard Medical School and the Barbados Nutrition Study collaborated to test their hypothesis that malnutrition during the first year of life increases a person's likelihood of exhibiting attention deficits when he or she is an adult. You can read more about this study in the April 2012 issue of *The Journal of Nutrition*.

The researchers utilized a subset of a dataset collected longitudinally since 1967 in Barbados. Although malnutrition in this Caribbean country has since been virtually eliminated, poor nutrition was relatively common there in the 1960s. Beginning in infancy, two groups of individuals were studied: 80 males who had experienced a finite period of protein-energy malnutrition during their first year of life and 65 male classmates who had not. Infants in the malnourished group were hospitalized for ~6 weeks during their first year of life and followed closely for 12 years to ensure adequate nutrition during childhood. All babies enrolled in this study had healthy birth weights, absence of pre- or postnatal complications, and no further malnutrition or serious medical illness other than the initial episode. Between 2007 and 2010, participants were again studied as adults (mean age: 40 years). Symptoms of attention-deficit hyperactivity disorder (ADHD) were assessed using the CAARS-Self-Reporting Screening Version questionnaire. The Conners CPT-11 testing regimen was used to document reaction time, impulsivity, and vigilance, and the Wechsler Abbreviated Scale of Intelligence was used to compute IQ scores. The association between previously reported school teachers' accounts of attention problems and adulthood attention deficits were also investigated.

Compared to those who were consistently well nourished in infancy, adults who had been malnourished in early life were found to have persisting attention deficits and lower scores on the CPT tests. There was also a clear association between teachers' behavioral assessments during childhood and likelihood of attention problems during adulthood. The authors concluded that "infantile malnutrition may have long-term effects on attentional processes nearly 40 years after the episode." Clearly, these findings likely have major public health implications for populations in which early childhood malnutrition is endemic.

Reference Galler JR, Bryce CP, Zichlin ML, Fitzmaurice G, Easlesfield GD, Waber DP. Infant malnutrition is associated with persisting attention deficits in middle adulthood. *Journal of Nutrition* 142:788-794, 2012.

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