The Journal of Nutrition – **June 2019**
Media Summaries

The following articles are being published in the June 2019 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.

Pinto beans may help lower cholesterol
Nguyen AT, Althwab S, Qiu H, Zbasnik R, Urrea C, Carr TP, Schlegel V. Pinto Beans (*Phaseolus vulgaris* L.) Lower Non-HDL Cholesterol in Hamsters Fed a Diet Rich in Saturated Fat and Act on Genes Involved in Cholesterol Homeostasis. *The Journal of Nutrition*. 2019;149(6):906-1003

Household food insecurity, stress and insulin resistance: Is there a connection?
Bermudez-Millan A, Wagner JA, Feinn RS, Segura-Perez S, Damio G, Chhabra J, Perez-Escamilla R. Inflammation and Stress Biomarkers Mediate the Association between Household Food Insecurity and Insulin Resistance among Latinos with Type 2 Diabetes. *The Journal of Nutrition*. June 2019;149(6):982-88

Commercial prenatal supplements: Are new clinical trials needed?
Saldanha LG, Dwyer JT, Andrews KW, Brown LL. The Chemical Forms of Iron in Commercial Prenatal Supplements Are Not Always the Same as Those Tested in Clinical Trials. *The Journal of Nutrition*. June 2019; 149(6):890-93

Pinto beans may help lower cholesterol

Elevated blood lipid levels increase risk of developing cardiovascular disease. Although cholesterol-lowering drugs are typically prescribed, a recent study by Dr. Vicki Schlegel and colleagues suggests that whole pinto beans may also effectively lower cholesterol. By supplementing diets rich in saturated fat with whole pinto beans and their hulls, the researchers investigated changes in cholesterol metabolism and the molecular mechanisms responsible for the cholesterol-lowering effects. The study results, published in the June 2019 issue of *The Journal of Nutrition*, suggest that pinto beans effectively lower cholesterol by decreasing cholesterol synthesis in the liver and cholesterol absorption in the small intestine.

Forty-four 9-wk-old male hamsters were randomly assigned into 4 groups based on diet, which included a normal-fat diet, a diet rich in saturated fat, a high saturated fat diet supplemented with whole pinto beans, and a high fat saturated fat diet supplement with pinto bean hulls. Plasma, liver, intestinal, and fecal samples were collected to evaluate multiple cholesterol markers and gene targets.

The plasma non-high-density lipoprotein concentration was significantly reduced in the whole pinto bean group and those fed pinto bean hulls by 31.9% and 53.6%, respectively, compared to hamsters fed diets high in saturated fats. Analyses of mechanistic pathways indicated that bioactive components present in pinto beans downregulated genes associated with cholesterol synthesis by the liver and cholesterol absorption by the small intestine. Another important cholesterol regulatory pathway, excretion of cholesterol via feces, was also reduced in hamsters fed diets supplemented with pinto beans. The results of this study provide additional support for pinto beans as an effective cholesterol lowering agent. Another noteworthy finding was the cholesterol-lowering effect of pinto beans is partially exerted by hulls. Pinto beans can easily be incorporated into the everyday diet for the prevention of elevated cholesterol or for use as an adjunct therapy for those with existing hypercholesterolemia.

Reference
Nguyen AT, Althwab S, Qiu H, Zbasnik R, Urrea C, Carr TP, Schlegel V. Pinto Beans (*Phaseolus vulgaris* L.) Lower Non-HDL Cholesterol in Hamsters Fed a Diet Rich in Saturated Fat and Act on Genes Involved in Cholesterol Homeostasis. *The Journal of Nutrition*. 2019;149(6):906-1003
https://academic.oup.com/jn/article/149/6/996/5475991

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Household food insecurity, stress and insulin resistance: Is there a connection?

In the United States, the rate of food insecure households is higher for Latinos than for white non-Hispanic households. The association between food insecurity and metabolic disorders such as type 2 diabetes disproportionately affects Latinos. Rates of type 2 diabetes are 12.1% among Hispanics compared with 7.4% for non-Hispanic whites. Insulin resistance, which occurs when cells are not able to respond normally to the hormone insulin, is the hallmark of type 2 diabetes. Food insecurity may increase risk of insulin resistance through various mechanisms such as increased propensity towards diet-related adiposity and central adiposity. Food insecurity is also a psychosocial stressor, which can trigger the release of cortisol and other stress hormones. It is also important to consider that food insecurity may be associated with systemic inflammation through associated psychosocial stress, adiposity, or a proinflammatory diet.

A recent study by Dr. Angela Bermudez-Millan (University of Connecticut School of Medicine) and colleagues examined the association between food insecurity and insulin resistance among low—income Latinos with type 2 diabetes and tested whether inflammation and stress hormones mediated this association. The study results, published in the June 2019 issue of *The Journal of Nutrition*, suggest that among Latinos with type 2 diabetes, food insecurity is associated with insulin resistance that is partially mediated through inflammation and stress hormones.

A total of 121 study participants with type 2 diabetes participated in the study. Of these, 85.8% were Puerto Rican, 74% were female, and the mean age of all participants was 60.7 (y). Based on a 6-item food security scale, 68% of respondents were classified as food insecure. Insulin resistance was based on fasting blood glucose and insulin levels. Stress hormones and other markers of inflammation were also measured. Compared with food-secure individuals, food-insecure individuals had significantly higher insulin resistance, and higher levels of insulin, glucose, stress hormone, and total cholesterol. Among Latinos with type 2 diabetes, food insecurity was associated with insulin resistance partially through inflammation and stress hormones. These findings highlight the importance of implementing interventions that address food insecurity in order to mitigate its effects on inflammation, stress, and insulin resistance.

Reference
Bermudez-Millan A, Wagner JA, Feinn RS, Segura-Perez S, Damio G, Chhabra J, Perez-Escamilla R. Inflammation and Stress Biomarkers Mediate the Association between Household Food Insecurity and Insulin Resistance among Latinos with Type 2 Diabetes. *The Journal of Nutrition*. June 2019;149(6):982-88
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Commercial prenatal supplements: Are new clinical trials needed?

Iron deficiency is common in the United States and is the leading cause of diet-related anemia. Nationwide studies suggest that a significant portion of women in the US consume insufficient amounts of dietary iron. Because iron requirements increase during pregnancy, women are advised to increase their intake of iron-rich foods or take an iron-containing prenatal dietary supplement. Published data on the amounts and chemical forms of iron used in formulating prenatal supplements are not available. Not only does product formulation affect iron bioavailability, the chemical forms of products on the market may also differ from those tested in clinical trials. A recent study by Dr. Leila Saldanha (Office of Dietary Supplements, National Institutes of Health) and colleagues used two National Institutes of Health's Dietary Supplement Label Databases to examine amounts and chemical forms of iron listed on the labels of all iron-containing nonprescription and prescription prenatal supplements. Study results are published in the June 2019 issue of *The Journal of Nutrition*.

Data from the two databases - the Dietary Supplement Label Database and DailyMed - were evaluated in relation to a systematic review of 61 clinical studies published in 2015 by the Cochrane Collaborative that assessed the effects of daily oral iron supplements (with or without other nutrients) used by pregnant women. Upon examination of nonprescription and prescription iron-containing prenatal supplement products, researchers found the labeled amount of pure iron ranged between 9 and 60 mg/serving in 148 nonprescription supplements and between 4.5 and 106 mg/serving in 101 prescription supplements. While ferrous sulfate was the form of iron most commonly used in the studies, ferrous fumarate is the form most often found on the labels of prenatal supplements. In fact, none of the prenatal supplements examined provided iron as ferrous sulfate.

The finding that prenatal dietary supplements contain forms of iron not studied in clinical trials may have important clinical implications. It's not known, for example, if pregnancy outcomes related to taking one form of iron supplement may be similar to taking one with a different iron form. Perhaps differences in chemical forms of iron (which affect iron bioavailability and safety) should be considered when evaluating the effect of formulations on maternal iron status.

Reference
Saldanha LG, Dwyer JT, Andrews KW, Brown LL. The Chemical Forms of Iron in Commercial Prenatal Supplements Are Not Always the Same as Those Tested in Clinical Trials. *The Journal of Nutrition*. June 2019; 149(6):890-93
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