Egg Nutrition Center
ENC
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Nutrition Close-Up

What's inside…

CARDIOMETABOLIC HEALTH

Dietary patterns to optimize endothelial function

By Elizabeth J. Reverri, PhD, RD, LDN

Cardiovascular disease currently affects approximately 86 million adults in the U.S. and has been the number one cause of mortality for almost 100 years. Because traditional risk factors fail to predict up to 50% of cardiovascular disease, other cardiovascular disease risk factors take on greater importance.[1]

One such cardiovascular disease risk factor is endothelial dysfunction, which refers to the inability of the arteries to sufficiently dilate in response to an endothelial stimulus.[1] Endothelial dysfunction contributes to the progression of atherosclerosis and is associated with many cardiovascular disease risk factors.[2]

The gold standard for measuring endothelial dysfunction is coronary epicardial vasoreactivity involving direct measurement of the coronary vascular bed using pharmacological stimuli. Unfortunately, this method is invasive, expensive, and time-consuming.[2] Noninvasive measurements of endothelial dysfunction include endothelial activation, such as increased soluble adhesion molecules (E-selectin, P-selectin, sICAM-1, and sVCAM-1), and endothelial-dependent vasodilation, such as flow mediated dilation of the brachial artery, among other functional measures.[3]

The majority of studies investigating the effects of diet on endothelial function have studied specific foods or nutrients, rather than overall diet. These types of studies contribute to the understanding of the physiological mechanisms.[4] Because food groups and nutrients are consumed as part of an overall eating pattern, investigating the effects of dietary patterns takes into account likely synergistic effects of whole foods[3] and analyzes the diet in a more relevant manner.[5]

A review by Schwingshackl et al.[6] investigated endothelial function after adherence to the Mediterranean diet. In general, the Mediterranean diet emphasizes regular consumption of fruits, vegetables, mostly whole grains, olive oil, beans, nuts, legumes, seeds, herbs, spices, fish, and seafood and moderate consumption of poultry, eggs, cheese, and yogurt.[7] The researchers included randomized controlled parallel-arm trials or crossover trials that were a minimum of 12 weeks long in adults. Of note, one of the reviewed studies randomized adults with metabolic syndrome to receive either a Mediterranean diet or a prudent diet of 50-60% carbohydrate, 15-20% protein, and <30% fat. They developed an endothelial function score that assigned points to the sum of the responses from blood pressure and platelet aggregation. After two years, the participants on the Mediterranean diet showed improved endothelial function scores, whereas the control diet simply maintained endothelial function scores. It was found that along with the other studies in this review, the Mediterranean diet increased flow mediated dilation of the brachial artery and decreased the soluble adhesion molecule, sICAM-1, thus improving endothelial function.[6]

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A nutrition scientist's perspective on the new food label

By Tia Rains, PhD

There's been a great deal of activity in Washington, D.C. lately resulting in some significant changes in the food and nutrition landscape. Most notably, the Food and Drug Administration (FDA) issued an overhaul of the Nutrition Facts Panels that appears on all foods and beverages. This is the first major change in the nutrition label since the early 1990s which, according to the FDA, "will help people make informed decisions about the foods they eat and feed their families."[1]

Indeed, serving size and calories per serving will soon be displayed more prominently on the label in larger, bold font. And serving sizes will be adapted to more closely reflect what people actually consume. Gone are the days of a 20-ounce bottle of soda being labeled as multiple servings. Under the new guidelines, a single serve package such as this will need to provide the nutrition information for the entire package. For larger, multi-serving packages, nutrition information will be displayed on a single serving basis as well as for the entire package.

Other changes include the addition of "total sugars" and "added sugars," and removal of "calories from fat." The list of mandatory vitamins and minerals has also changed from vitamin A, vitamin C, calcium, and iron to vitamin D, calcium, iron, and potassium. These updates reflect newer research and dietary guidelines on nutrients that are typically consumed at levels below recommendations.

However, newer research was not applied to other nutrients, specifically dietary cholesterol. Cholesterol remains on the label, both as an absolute amount and relative to its daily value, defined as 300 mg. This despite the 2015-2020 Dietary Guidelines for Americans that removed the daily limit of 300 mg/day.

The nutritionist in me celebrates these changes as a positive step toward improving public health. Communicating relevant nutrition information in a format that is easy to digest (pun intended) should allow consumers to make smarter food choices. This seems particularly true for multi-serve snack foods and beverages that previously may have been misleading because the nutrition content was presented for a fraction of what was contained in the package. As a consumer that is sensitive to daily calorie intake, this change is very appealing to me.

The scientist in me is curious about whether these efforts will truly lead to better choices by the majority of consumers. To the best of my knowledge, there are few if any studies to suggest eating behaviors have been changed by more prominently presenting nutrition information on a food package. And it remains unclear if and how the new labels will help consumers build the healthy dietary patterns recommended by the Dietary Guidelines.

That said, there is some indication that displaying calorie content on fast food menus affects food choices. Several studies have shown that diners select approximately 100 fewer calories at lunch when calorie values are displayed next to food choices[2,3] although more recent analyses suggest that this may be driven by subsets of the population,[4] specifically those that are interested in the information, such as people that are already health conscious.

Whether alterations in the food label ultimately affect overall public health remains to be determined. With obesity rates continuing to climb and type 2 diabetes right on its heels, it's clear that wide-sweeping changes are needed within numerous sectors. Enhancing clarity of the nutrient label seems like a step in the right direction, although some would say it doesn't go far enough to explain how some ingredients affect health (e.g., saturated fat, added sugars). At the very least, I hope the "buzz" around these changes raises awareness of the importance of considering nutrients within a food prior to purchasing.

Tia Rains, PhD, is Senior Director, Nutrition Research & Communications at the Egg Nutrition Center.

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Guiding Stars updates its guidance on cholesterol

Leslie Fischer, PhD

Guiding Stars, North America's leading private nutrition guidance program, recently updated its approach to factoring dietary cholesterol into its ratings system. The move came in response to evolving scientific evidence and changes reflected in the 2015 Dietary Guidelines for Americans. Dr. Mitch Kanter, Executive Director of the Egg Nutrition Center (ENC), spoke with Dr. Leslie Fischer, a scientific advisor to the Guiding Stars program and one of the rating system's chief developers, about the rationale behind the changes in its cholesterol rating. Here's what Dr. Fischer had to say in response to Dr. Kanter's questions:

ENC: Can you describe the Guiding Stars program for our readers? What's it all about?

Dr. Fischer: Guiding Stars is now celebrating its 10th anniversary. We're the world's first store-wide, point-of-purchase nutrition guidance program. Shoppers can follow the stars to make more nutritious purchasing choices using a simple, easy to understand one, two, or three-star system. The program is based on a patented, evidence-based, transparent algorithm that objectively evaluates the nutritional quality of foods, weighing nutrients to encourage such as vitamins, minerals, and fiber against nutrients to limit such as sodium, added sugars, and saturated fat. We maintain an extensive database of over 100,000 foods that is audited and updated on a regular basis.

ENC: What's the story behind the algorithm?

Dr. Fischer: It's actually quite interesting. The algorithm was created by a scientific advisory panel that includes experts in nutrition, biochemistry, and public health. They meet regularly and continue to review the latest nutrition science. Whenever national or international nutrition policy such as the Dietary Guidelines for Americans (DGA) are revised, the Guiding Stars scientific advisory panel carefully reviews those recommendations and the most current consensus scientific evidence to determine whether any revisions should be made to the algorithm. This procedure was followed when the 2015 DGA were released in early 2016.

ENC: How does the Guiding Stars program help shoppers make healthier purchasing decisions?

Dr. Fischer: Guiding Stars is a simple, at-a-glance tool that allows shoppers to quickly identify and choose foods that offer the most nutrition for the calories. It essentially takes the guesswork out of nutritious shopping by eliminating the need to compare every item in the store. That saves shoppers time. Instead of having to study food labels, shoppers can quickly glance at shelf tags within each section of a store and pick out the items earning stars. The purpose of Guiding Stars is not to tell shoppers what to buy, but to help them make more nutritious choices for themselves and their families.

ENC: What surprised you most about the changes in the federal government's 2015 Dietary Guidelines?

Dr. Fischer: One thing that surprised me most was the shift away from isolated nutrients and the emphasis on different overall eating patterns that encompass multiple lifestyles and can be tailored to individual preferences. The recommended quantitative limit on added sugars was also an unexpected change.

In terms of cholesterol, while elevated blood cholesterol is a known risk factor for cardiovascular disease, the most current scientific evidence does not support a direct link between dietary and blood cholesterol. For example, a very recent study conducted in Finland found that regular egg consumption over a 20-year follow-up period did not increase the risk of coronary heart disease.[1]

ENC: What research can you point to that may have prompted changes in the dietary cholesterol guidelines?

Dr. Fischer: The Dietary Guidelines' revised position on dietary cholesterol is in contrast to its recommendations for saturated fats (which call for a quantitative limit of less than 10% of total calories per day) and trans fats (consumption should be as low as possible), which are more definitively linked to increased blood cholesterol levels. The switch in emphasis away from dietary cholesterol and onto saturated fats and trans fats is not unique to the DGA. In 2013, the American Heart Association and the American College of Cardiology released new guidelines about diet and other lifestyle changes for the management of cardiovascular disease risk factors in adults. Their recommendations also did not call for a specific limit on dietary cholesterol, and instead emphasized restricting saturated fat and trans fats intake.

It is important to note that the removal of a quantitative limit on dietary cholesterol in either the DGA or the Guiding Stars algorithm does not mean that dietary cholesterol intake is no longer important, especially among at-risk populations such as individuals with type 2 diabetes. This is largely because most foods that are high in cholesterol also tend to be high in saturated fat. However, cholesterol-containing foods such as eggs and shellfish which are lower in saturated fat need not be limited in the same way, and can be enjoyed as part of an overall eating pattern that supports cardiovascular health.

ENC: Any new changes you see coming along over the next few years regarding diet and health? Any nutrients we should watch out for?

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Novel strategies to lower inflammation through diet

By Kristen Arnold, RDN, LD

The two leading causes of death for women in the United States, cardiovascular disease and breast cancer, are associated with elevated chronic inflammatory markers. Strategies to reduce inflammation are a possible treatment strategy to prevent rampant chronic diseases in postmenopausal women, a population particularly vulnerable to elevated chronic inflammation.[1] Improved overall diet quality is associated with reduced chronic inflammatory markers and is a possible avenue for treatment in postmenopausal women. Low added sugar (less than 10% of daily calories from added sugar), omega-3 fatty acids (from fatty fish), and high fiber (20 g fiber from fruits, vegetables, whole grains, and legumes) in the diet are three strategies proposed to improve diet quality and lower chronic inflammation.

Chronic inflammation triggers the release of inflammatory cytokines which contribute to cellular damage leading to the onset and progression of disease.[1] Certain chronic diseases such as type 2 diabetes, atherosclerosis, and osteoporosis have an inflammatory component. Current treatments to lower chronic inflammation, such as steroids and non-steroidal anti-inflammatory drugs (NSAIDS), have several negative long-term side effects. Therefore, there is a critical need to develop therapies that are safe and efficacious in order to lower chronic inflammation and improve health outcomes, specifically in postmenopausal women. Focusing on improving diet quality, with attention to certain dietary components known to have anti-inflammatory properties, is a safe and novel approach to reducing inflammation and the associated risk for disease.

Higher scores obtained from the Healthy Eating Index 2010 (HEI) are inversely related to inflammation, independent of body weight, in epidemiological studies of postmenopausal women.[2] HEI is a validated tool to measure overall diet quality. It consists of 12 dietary components that match the USDA Federal Dietary Guidelines for Americans. Improving diet quality is a viable approach to reducing inflammation and improving long-term health outcomes and quality of life.[3] Through improving specific dietary components, overall diet quality can be improved.

Omega-3 fatty acids (n-3 FAs) from fatty fish, and plant foods rich in fiber (whole grains, fruits, vegetables, and legumes) have well established anti-inflammatory properties.[4,5] Other dietary components such as added sugars have been shown to increase inflammatory markers and are associated with higher mortality from inflammatory diseases in postmenopausal women.[6] The World Health Organization recommends that adults consume less than 10% of total daily calories from 'free sugars,' a term that refers to all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and fruit juices.[7] Not only may added sugars promote inflammation, but studies conducted on animals suggest that they may also compromise the anti-inflammatory effects of omega-3 fatty acids in the diet.[8]

This leads to the exciting possibility that a diet low in added sugars and high in fiber and omega-3 fatty acids (LAS-O3) may be effective in lowering inflammation in

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Messages

- Inflammatory markers are associated with risk for chronic diseases, particularly in postmenopausal women.
- Studies suggest that added sugars may compromise the anti-inflammatory effects of omega-3 fatty acids.

Foods that most contribute to added sugar in the American diet

- regular soft drinks, energy drinks, and sports drinks
- candy
- cakes
- cookies
- pies and cobblers
- sweet rolls, pastries, and donuts
- fruit drinks, such as fruitades and fruit punch
- dairy desserts, such as ice cream and pudding

High-fiber fruits, vegetables, whole grains and legumes

- broccoli
- corn
- peas
- potatoes
- spinach
- black beans
- black-eyed peas
- pinto beans
- white beans
- lentils
- apples (with skin)
- apricots
- blueberries
- cantaloupe
- plums
- prunes
- raisins
- quinoa
- brown rice
- buckwheat
- whole wheat products
- oats

Fish high in omega-3 fatty acids

- Salmon
- Albacore Tuna
- Sardines
- Atlantic Mackerel
- Herring
- Rainbow trout
- Anchovies

The egg: a useful tool for eating disorder nutrition therapy

By Kylie Thompson, RDN

As health professionals, we often idealize a nutrient-dense eating pattern as a tool to prevent disease. However, it is also important to recognize its role in the treatment of disease. This article describes the role of nutrition in the treatment of eating disorders (ED), and more specifically, anorexia nervosa (AN).

EDs often develop from a perfect storm of genetics, neurobiology, temperament and environment, although common beliefs of etiology may be muddled by misinformation and social stigma.[1] The physiologically normal and reward-motivated act of eating increasingly becomes associated with guilt and anxiety. This leads to the restriction of energy intake and over time, results in significantly low body weight, distorted body image, and extreme fear of gaining weight.[1] The complexities of this illness require a multi-disciplinary treatment team consisting of a physician, mental health professional, and registered dietitian/nutritionist (RDN). Taking all three of these important roles into consideration, nutrition therapy delivered by a RDN is critical for recovery.

The inherent nature of AN often inhibits effective and sustainable treatment, even with increasing research and knowledge of its etiology. Too often patients relapse, however. It is well established that early intervention is the most effective treatment.[2] Just as AN severity exists along a spectrum, so too does the required intervention.[3] In patients requiring inpatient or residential treatment, a primary role of the RDN is to first restore nutrition and weight status for cognitive function and medical stability.[3] This initial nutrition therapy is needed to ensure further progression in recovery.[1] In patients requiring a lower level of care, the RDN partners with the patient to help mend the damaged relationship with food. Development of rapport allows the exchange of necessary information about normal eating patterns that will meet each patient's energy and nutrient needs. It is worth noting that accomplishing this task requires effort and skills in behavioral therapy and personalized nutrition counseling, reinforced by frequent communication between the patient and all treatment team members.

Meal planning

Education about normal eating patterns encompasses assistance with meal planning. It is important that patients are involved in their own meal planning once it is considered appropriate by their treatment team. This skill should be practiced in a qualitative manner to reinforce the value of nutrition knowledge. Patients with AN often choose to eat the same food again and again, a tendency that has been shown to persist into recovery.[3] Meal planning should emphasize a variety of foods along with a balance of macro- and micronutrients. A meal plan that achieves variety has been shown to be predictive of weight maintenance in AN.[3] While some consideration may be given to macronutrient distribution, the primary goal is achieving adequate energy intake.[3]

Daily intake of foods containing protein of high biological value such as whey, casein and egg whites should be recommended. Consuming a small amount of these protein sources, coupled with foods that are perceived by ED patients as less challenging, can assist in efficient restoration of nutrition status.[3]

Achieving adequate fat intake is also critical, yet often more challenging, as AN patients tend to avoid fat consumption. For this reason, AN patients are often deficient in the essential fatty acids: alpha-linolenic acid, an omega-3, and linoleic acid, an omega-6.[4] These fatty acids are essential because they are not produced by the body and must be acquired through the diet. Omega-3s have captured a lot of attention recently as they are needed for maintenance of cell membranes, regulation of gene expression, and cognitive function.[4]

The RDN is a critical member of the eating disorder treatment team and should be constantly on the lookout for tools to add to their toolbox. One go-to food for

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Here's a quick recipe for apple cinnamon oatmeal with an egg boost:

Ingredients:

- one egg
- ⅓ cup of milk
- one pkg. apple & cinnamon instant oatmeal (1.23 oz)
- ¼ cup vanilla yogurt

Directions:

- Beat egg and milk in 2-cup microwave-safe bowl until blended. Stir in oatmeal
- Microwave on HIGH until liquid is absorbed and egg is set (90 seconds to 2 minutes). Top with yogurt.

Messages

- Eating disorders (ED) are debilitating diseases that resist treatment and require the multidisciplinary teamwork of a physician, mental health professional, and a Registered Dietitian Nutritionist (RDN).
- Meal planning is an acquired skill, and ED patients should become involved in their own meal plans at a time best determined by the treatment team.

Dietary patterns to optimize endothelial function

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Defago et al.[5] reviewed dietary patterns and endothelial biomarkers from observational and cross-sectional studies. They found several studies used factor analysis to identify a healthy dietary pattern and had beneficial responses on circulating endothelial biomarkers. From the Nurses' Health Study, two dietary patterns emerged: one was a prudent pattern characterized by higher dietary intake of fruits, vegetables, legumes, fish, poultry, and whole grains, whereas the other was a so-called Western pattern with higher dietary intakes of red and processed meats, sweets, desserts, French fries, and refined grains. The prudent pattern was inversely associated with E-selectin, whereas the Western pattern was positively associated with E-selectin, sICAM-1, and sVCAM-1. A similar study design was applied to the ethnically diverse Multi-Ethnic Study of Atherosclerosis, but four dietary patterns were revealed. The beans, tomatoes, refined grains, and high-fat dairy products dietary pattern was positively related to sICAM-1. In contrast, the whole grains and fruit dietary pattern was inversely associated with sICAM-1. Lastly, among Iranian women, their healthy dietary pattern consisted of high amounts of fruits, vegetables, poultry, legumes, tea, and whole grains and was inversely associated with the adhesion molecules, sVCAM-1 and E-selectin, whereas the Western dietary pattern was positively correlated with sICAM-1 and sVCAM-1.5

Since these reviews were published, Sauder et al.[4] assessed adherence to the 2010 Dietary Guidelines for Americans on various measures of vascular health. The Dietary Guidelines for Americans promotes a healthy dietary pattern emphasizing consumption of fruits, vegetables, low-fat dairy, whole grains, and lean meats. The researchers applied an adherence index tool to a food frequency questionnaire filled out by participants from the Framingham Heart Study. They found that closer adherence to the Dietary Guidelines for Americans was linked to better vascular health in adults under the age of 50 years, based on the following measures of vascular health: lower mean arterial pressure, carotid-femoral pulse wave velocity, and augmentation index.[4]

In conclusion, several healthy dietary patterns improve endothelial dysfunction. Ultimately, there are a variety of eating patterns that may reduce the risk of this emerging cardiovascular disease risk factor.

Elizabeth (Beth) J. Reverri, PhD, RD, LDN is a registered dietitian and human nutrition researcher at The Ohio State University.

Messages

- Endothelial dysfunction is an emerging cardiovascular disease risk factor, which contributes to the progression of atherosclerosis.
- Healthy dietary patterns that emphasize vegetables, fruits, whole grains, low-fat dairy and lean sources of protein may improve endothelial function.

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Guiding Stars updates its guidance

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Dr. Fischer: A growing body of evidence has been linking artificial colors to inattentiveness and hyperactivity in sensitive children. In response to this Guiding Stars will soon be studying the issue to consider possibly debiting foods containing artificial colors. One outcome might be that any foods containing artificial colors will get fewer stars or no stars at all. We are starting to see more food manufacturers replace artificial colors with naturally sourced color additives such as beetroot juice (as is widely being done in Europe).

Also given the new changes announced by the FDA to the Nutrition Facts Label, the exact amount of added sugars will soon be specified on all foods carrying a food label. As this information has previously not been available, the Guiding Stars algorithm has had to rely on a proxy estimate of added sugars. Once this information is available, the algorithm will be revised in order to evaluate and debit added sugars more accurately.

Dr. Leslie Fischer is a member of the scientific advisory panel for the Guiding Stars point-of-purchase nutrition guidance system and was one of the chief developers of the evidence and policy-based algorithm that underlies this patented program. She previously was a faculty member in the Nutrition Department at the University of North Carolina for 16 years where she worked on nutrition-based clinical research trials, including a study on whether maternal intake of eggs or supplemental choline during pregnancy can enhance fetal brain development.

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The egg: a useful tool

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meal planning that should be in everyone's toolbox is the egg. It contains protein of high biological value, omega-6 fatty acids, and some varieties of eggs can also be a source of omega-3 fatty acids.

The egg can be prepared in a variety of ways to suit the tastes of most everyone. For instance, some ED patients will eat traditional scrambled eggs without reluctance. Others, however, who are resistant to a meal plan including eggs, may be more accepting of a breakfast such as oatmeal prepared with an egg. This not only increases the nutrient density and quality of the oatmeal, but adds variety to the diet without altering taste.

Kylie Thompson, RDN, is a Human Nutrition M.S. student at The Ohio State University. She is also working with retailers to assist in meeting FDA regulations for the upcoming menu nutrition guidelines. Her passion lies in working with eating disorders and staying current on recent literature in the field.

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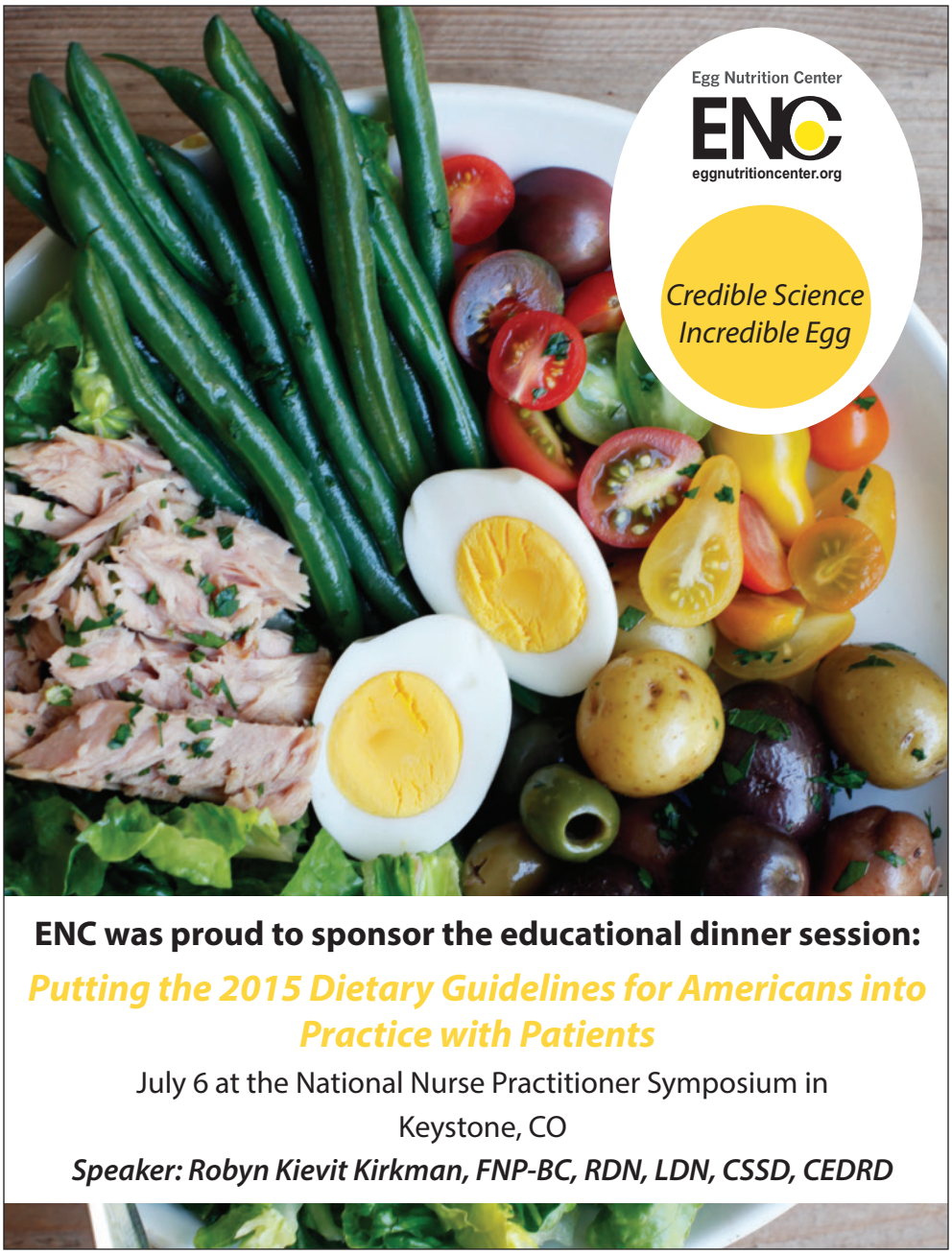

ENC was proud to sponsor the educational dinner session:

Putting the 2015 Dietary Guidelines for Americans into Practice with Patients

July 6 at the National Nurse Practitioner Symposium in Keystone, CO

Speaker: Robyn Kievit Kirkman, FNP-BC, RDN, LDN, CSSD, CEDRD

Lower inflammation through diet

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postmenopausal women. Improving overall diet quality through specific dietary components proposed to lower chronic inflammatory blood markers has the potential to reduce postmenopausal women's risk for their most common killers. More research is needed to investigate the effects of combining various dietary components to improve diet quality and reduce chronic inflammation.

Kristen Arnold, RDN, LD, is from the Department of Human Sciences at The Ohio State University. She also provides nutrition counseling services and promotes nutrition and wellness as a source of empowerment at speaking engagements and as author for scientific journals, newsletters, blogs and listservs.

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American College of Sports Medicine Webinar
Optimal Recovery: Practical Recommendations for the Recreational Athlete
Wed, Aug. 17, 2016 2:00 PM - 3:00 PM EDT
Speakers: Rachel Bassler, RDN, CSSD, LDN and Irene Lewis-McCormick, MS, CSCS

Cardiometabolic Health Congress
October 5-8, Boston, MA

Food & Nutrition Conference & Expo
October 15-18, Boston, MA

We welcome your ideas!

Please send topic and author suggestions to ENC@eggnutritioncenter.org

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