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### ABOUT ENC

ENC is a credible source of nutrition & health science information & the acknowledged leader in research & education related to eggs.

## PROTEIN FOODS FROM A VARIETY OF SOURCES CONTRIBUTE TO NUTRIENT ADEQUACY

by MICKEY RUBIN, PHD



There has been considerable debate recently around the topic of protein quality, particularly regarding the best way to measure protein quality<sup>1</sup> as well as the relative importance of dietary protein quality as it relates to important health outcomes, such as muscle loss with aging.<sup>2</sup> While this discussion is important and will no doubt continue as research in this area evolves and new measures for protein quality are developed,<sup>3</sup> less attention is often given to the important contribution of protein foods to overall nutrient adequacy. Commonly consumed protein foods contribute to nutrient intake, diet quality, and nutrient adequacy, independent from their contributions to total protein intake.<sup>4</sup>

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# PROTEIN FOODS FROM A VARIETY OF SOURCES CONTRIBUTE TO NUTRIENT ADEQUACY

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Protein foods provide important micronutrient diversity. Foods within the protein foods group provide B vitamins (e.g., niacin, vitamin B12, vitamin B6, and riboflavin), selenium, choline, phosphorus, zinc, copper, vitamin D, and vitamin E just to name a few.<sup>5</sup>

For example, meats provide the most zinc, while poultry provides the most niacin.<sup>5</sup> Seafood provides the omega-3's eicosapentanoic acid (EPA) and docosahexaenoic acid (DHA). Eggs provide the most choline of any commonly consumed protein food, while nuts and seeds provide vitamin E, and soy and legumes are sources of copper, manganese and iron.<sup>5</sup> Indeed, if we focus just on the protein that is provided by the protein foods group, we are missing the larger picture of what these foods contribute to healthy diet patterns.

## **Nutrient-Dense Eggs Make Important Contributions to the Diets of Americans of All Ages**

Eggs are a prime example of a protein food that should be just as appreciated for their micronutrient contribution to healthy eating patterns as they are for their macronutrient contribution. Analysis of NHANES 2003-2012 reveals that in adults  $\geq 19$  years, whole egg consumption is associated with a higher likelihood of meeting or exceeding recommendations for several micronutrients, including nutrients identified by the 2015-2020 Dietary Guidelines as Nutrients of Public Health Concern such as vitamin D, calcium, and iron. Egg consumption is also associated with higher likelihood of meeting the recommendations for other underconsumed nutrients such as choline.<sup>6</sup> Importantly, egg consumption was not associated with serum total cholesterol or LDL cholesterol in this analysis.

In fact, several lipid related risk factors were improved with higher egg consumption, including triglycerides, the triglyceride to HDL-cholesterol ratio, and the total cholesterol to HDL-C ratio.<sup>6</sup>

NHANES data in infants and toddlers ages 6-24 months revealed that those who consume eggs have greater intakes of choline, lutein + zeaxanthin,  $\alpha$ -linolenic acid, DHA, vitamin B12, phosphorus, and selenium. Egg consuming infants and toddlers also had higher intakes of total fat, monounsaturated fat, saturated fat, and sodium, but also lower added sugar and total sugar compared to non-consumers of eggs. Importantly, egg consumption in infants was associated with longer recumbent length when compared to non-consumers of eggs.<sup>7</sup>

Findings in children and adolescents ages 2-18 years showed a similar story, revealing those who consume eggs have greater intakes of protein, polyunsaturated, monounsaturated and total fat,  $\alpha$ -linolenic acid, DHA, choline, lutein + zeaxanthin, vitamin D, potassium, phosphorus, and selenium compared to non-egg consumers.<sup>8</sup>

## **Plant vs. Animal or Plant *and* Animal?**

Perhaps all too often the nutrition conversation regarding protein foods has turned to a debate between animal and plant protein sources. However, both animal and plant protein sources provide essential nutrients that are important for healthy dietary patterns. The emphasis away from animal source protein foods is generally evidenced by the association of some of these foods with cardiovascular risk, although randomized controlled studies show that nutrient-dense diets containing animal protein can improve cardiovascular disease risk factors,<sup>9</sup> and animal source foods like eggs may



have nutrients important for other outcomes such as neurocognitive development.<sup>10</sup>

The 2015–2020 DGA recommends adopting healthy eating patterns that contain a variety of protein foods, including seafood, lean meats and poultry, eggs, legumes, nuts, seeds, and soy products. A recent editorial by Dr. Wayne Campbell of Purdue University uniquely captured the idea that eating protein foods does not have to be an either or proposition, stating that “debates pitting meats against protein-rich plant foods seem less useful to consumers than helping both omnivores and vegetarians understand the health properties of the foods they choose to consume and educating them to include a variety of suitable protein-rich foods within healthy eating patterns.”<sup>11</sup>

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**RESEARCH HOT OFF THE PRESS**

**Consumption of Two Whole Eggs Per Day Improved HDL Functionality**

A recent ENC-sponsored randomized crossover trial in overweight, postmenopausal women found that consumption of two whole eggs/day as part of breakfast meals improved cholesterol efflux capacity (HDL functionality). In other words, consumption of eggs helped “good cholesterol” function better.

These exciting new data demonstrate potential positive impact of eggs on markers of cardiovascular health.

Sawrey-Kubicek L et al. Whole egg consumption compared with yolk-free egg increases the cholesterol efflux capacity of high-density lipoproteins in overweight, postmenopausal women. *Am J Clin Nutr*. 2019 [e-pub ahead of print].

# EGGS: A PERFECT INGREDIENT FOR POWERFUL PRODUCE PAIRINGS



by AMY MYRDAL MILLER, MS, RDN, FAND and LAUREN SIMIN

## KEY MESSAGES

- Nutrient-rich eggs are a powerful ingredient to pair with vegetables.
- Consuming eggs with vegetables that contain vitamin E enhances the absorption of both alpha- and gamma-tocopherol.
- World cuisines provide endless inspiration for pairing eggs and vegetables that promote health and provide appealing flavors, textures, and aromas.



Too often, nutrition discussions emphasize single nutrients or foods. Focusing on recipes, meals, and dietary patterns are

better approaches for ensuring nutrient needs are met. It is also essential to ensure recommendations focus on flavor and enjoyment. This is especially true when making recommendations to motivate people to choose foods from under-consumed categories like vegetables. Dietary intake data show overall vegetable intake is below the recommended intake for more than 80 percent of Americans.<sup>1</sup>

At the 2019 Produce for Better Health Foundation *Consumer Connection* conference, a culinary session highlighted five powerful produce pairings that use flavor synergy to create deliciousness in ways that may help increase vegetable consumption. The presenters, culinary nutrition expert Amy Myrdal Miller and Certified Master Chef Ron DeSantis, created pairings that featured the flavor as well as nutrient benefits for pairings like eggs and avocados.



Our perception of flavor is impacted by all our senses from sight, smell, and sound to taste and touch. Of our five senses, our sense of smell has the greatest impact on our perception of flavor or deliciousness. About 80 percent of our flavor perception is influenced by what we smell, and what we smell is influenced by several aromatic organic compounds.<sup>2</sup>

Amy and Chef Ron knew that Hass avocados, at a certain stage of ripeness, contain a volatile organic compound that can mimic the flavor of cooked bacon. Who doesn't love the classic pairing of bacon and eggs? But Amy and Chef Ron knew they could develop a pairing that had a better nutrition story to tell. Research has shown that consuming eggs with vegetables that contain vitamin E enhances the absorption of both alpha- and gamma-tocopherol.<sup>3</sup> Avocados contain several carotenoids, including alpha-tocopherol.<sup>4,5</sup>

The final recipe, Avocado and Potato Hash with Sunny Side Eggs, also featured cooking techniques that contributed to the final flavor profile. Sautéing the diced avocado in extra virgin olive oil helped release the aromatic compounds in

the avocado. When the sunny side eggs were placed on top of the potato-avocado hash, the flavors and textures of the eggs with their silky running yolks, and the seared avocados, perfectly complemented and enhanced each other.

The strategy of pairing eggs with vegetables is not a new one. In Mediterranean countries from Europe and the Middle East to North Africa, home cooks have been poaching eggs in a tomato-based sauce with herbs and aromatics for centuries. The Israelis call it *shakshuka* while the Greeks call the dish *avgozoumo*. Cooks in the North African countries of Algeria and Tunisia make a similar dish, but they use more vegetables in the sauce in which the eggs get poached or gently scrambled. Culinary historian Clifford Wright asserts that all forms of *shakshuka* originated in Turkey from a dish called *menemen*, which includes small peppers like the shishito and padron peppers found in the U.S.<sup>6</sup>

The possibilities for pairing eggs with vegetables are endless when we look for inspiration from world cuisines that, for centuries, have found ways to create delicious food through thoughtful ingredient selection and the use of culinary techniques that enhance flavor. Given the health-promoting benefits and consumer appeal of Mediterranean dietary patterns, recommending recipes from that part of the world can be an especially powerful health promotion strategy.

*About the authors: Amy Myrdal Miller is president of Farmer's Daughter Consulting in Carmichael, CA. Lauren Simin, a summer intern working with Amy, is completing her undergraduate degree in nutrition science at Baylor University in Waco, TX.*

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## RECIPE



## AVOCADO & POTATO HASH WITH SUNNY SIDE EGGS

### Ingredients

- 1 Tablespoon extra virgin olive oil
- 4-5 Mozart potatoes (red skin with yellow flesh), peeled and medium diced
- ½ cup white onions, diced small
- Pinch of crushed red pepper flakes
- 2 large avocados, diced medium
- 1 teaspoon fresh lemon juice
- 1 Tablespoon fresh parsley
- 1 teaspoon kosher salt
- 8 large eggs
- 3 Tablespoons unsalted butter
- ¼ cup radishes, thinly sliced, hold in ice water to crisp

Microgreens to garnish

### Directions

1. In a large sauté pan heat oil and add potatoes. Cook over medium heat stirring occasionally for 8-9 minutes.
2. Add onions, red pepper flakes, and avocados. Continue to cook for another 6-7 minutes until potatoes are tender.
3. Add lemon juice, parsley, and salt.
4. In another large sauté pan cook eggs sunny side up in butter, season with salt and pepper.
5. Divide avocado hash among four plates or shallow bowls and top each portion with two eggs. Garnish with radishes and microgreens.

# FOOD AS LIFESTYLE MEDICINE

 by VICTORIA SHANTA RETELNY, RDN, LDN

## KEY MESSAGES

- Healthful eating is a key component of lifestyle medicine, which focuses on the prevention of chronic diseases such as cardiovascular disease, type 2 diabetes, certain cancers, and cognitive decline.
- Evidence shows that incorporating eggs into a plant-based eating pattern contributes to a healthy lifestyle.
- The synergy of nutrients in foods like eggs plays an important role in supporting overall health and promoting longevity.



Disease prevention is the key when it comes to living a longer, healthier life. Lifestyle medicine, which focuses on prevention rather than treatment of chronic diseases, is gaining momentum. The World Health Organization estimates that, by 2020, two-thirds of all diseases will be a result of lifestyle factors.<sup>1</sup> The good news is that chronic diseases, such as type 2 diabetes, cardiovascular disease and certain cancers, could be avoided through the adoption of healthy lifestyle recommendations.<sup>2</sup> Healthful eating is one of the main interventions in lifestyle medicine – along with active living, healthy weight and emotional resilience – the ability to handle adverse situations and bounce back to your baseline state of health.<sup>2</sup> Therefore, recognizing that a nourishing, healthy eating pattern is a vital part of disease prevention and supports an active, healthy and happy life is essential.

A plant-forward diet of fiber-filled vegetables, fruits, whole grains, nuts and seeds combined with high-quality protein foods, such as eggs, are all part of a healthy eating pattern. Eggs are

game-changers in the kitchen – they are versatile and pair well with plant foods, plus they can help with the absorption of fat-soluble nutrients, such as vitamin E and carotenoids.<sup>3,4</sup> Plus, eggs are a nutrient-dense food – for only 70 calories, a large egg offers a good or excellent source of eight essential nutrients, including an excellent source of vitamin B12, biotin, iodine, selenium and choline. Together, the egg yolk and white offer a unique nutrient package, however nearly all of the vitamins and minerals are in the marigold-colored yolk. The yolk carries the vitamins A, D, and E, as well as iron, selenium, phosphorus, zinc, choline – and the carotenoids lutein and zeaxanthin, making consumption of the whole egg a smart nutrition move.

Evidence shows that incorporating eggs into a regular eating pattern is a beneficial adjunct to a healthy lifestyle. Nutrients found in eggs can play a role in supporting the total body from brain to eyes, to muscles and bones. Eggs have two important nutrients for cognitive health – lutein and choline. Choline is critical for brain development during pregnancy and infancy. Humans can produce small amounts of choline, however it must be consumed in the diet to prevent deficiency.<sup>5</sup> Two large eggs supply more than half of the recommended intake of choline for pregnant women.<sup>5</sup> Lutein and zeaxanthin, carotenoids abundant in egg yolks (252 mcg per large egg), is known to accumulate in the retina of the eyes and help prevent age-related macular degeneration, but recently science has shown that lutein accumulates in the brain, as well, and can help older adults to maintain sharp cognitive abilities<sup>6</sup> and children perform better in school.<sup>7</sup> With the rate of diabetes continuing to climb among Americans, eating eggs can be beneficial as they have high-quality protein, essential nutrients and no added sugar, plus eggs have been shown to help increase feelings of fullness, which may lead to eating less and potential weight loss. In a randomized control trial,



people with type 2 diabetes were less hungry and satiated after eating two eggs per day.<sup>8</sup> Additionally, the same trial reported no adverse changes in cardiometabolic risk factors with two eggs per day compared to a low egg diet.<sup>9</sup>

Ultimately, one food alone doesn't predict an individual's health outcomes as it's the culmination of lifestyle factors such as dietary patterns, physical activity, as well as genetics, that affects the predisposition to chronic diseases like cardiovascular disease and type 2 diabetes.<sup>10</sup> However, the synergy of optimal nutrients in eggs can help contribute to the disease prevention strategies inherent in lifestyle medicine to promote health and longevity.

*Vicki Shanta Retelny, RDN, is a lifestyle nutrition expert, writer, speaker and culinary consultant. She is the author of two books, The Essential Guide to Healthy Healing Foods and Total Body Diet for Dummies. She lives to eat well with her husband, two children and their pet pug in Chicago, IL. Vicki blogs at Simple Cravings. Real Food.*

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## UPCOMING EVENTS

**SEPT** **Better Breakfast Month**  
September is Better Breakfast Month!  
Visit [EggNutritionCenter.org](http://EggNutritionCenter.org) for some delicious  
breakfast recipes featuring eggs.  
{ **SEPTEMBER 1-30** }

**OCT 11** **World Egg Day**  
On { **OCTOBER 11** } join countries around the globe  
to celebrate the goodness of the egg.

**OCT 26** **Food & Nutrition Conference & Expo™**  
Academy of Nutrition and Dietetics  
Philadelphia, PA  
{ **OCTOBER 26-29** }