Update: saturated fats not so bad after all

By Nina Teicholz

This year has seen a proliferation of nutrition headlines that for the past half century would have been unthinkable. It seems that saturated fats, like those found in red meat and cheese, might not be so bad for health after all.

In March, an international team that included scientists from Harvard and Cambridge published their review of all the evidence, concluding that these fats could not be said to cause heart disease. A similar “meta-analysis,” published in The American Journal of Clinical Nutrition in 2010, concluded the same. The fact is that there has never been solid evidence that these fats cause disease. We only believed this to be the case because nutrition policy has been derailed for decades by a mixture of bad science, politics and bias.

Studies on saturated fats can be traced back to the 1950s, when a scientist named Ancel Keys from the University of Minnesota proposed the hypothesis that these fats caused heart disease. His colleagues were receptive at the time because the nation was in a panic about this killer disease, which had arisen out of nowhere in the early 1900s to become a leading cause of death. Dr. Keys had an outsized and aggressive personality—his fame and influence eventually landed him on the cover of Time magazine—and he managed to persuade the American Heart Association (AHA) to follow his advice. In 1961, that group issued the world’s very first dietary guidelines, advising people to cut back on saturated fats and cholesterol as the best prevention against heart disease.

Yet the evidence for this recommendation appeared weak. It relied primarily on one study, which was conducted by Dr. Keys. In the “Seven Countries Study,” Dr. Keys examined nearly 13,000 men in the U.S., Japan, and Europe and discovered what he had hoped for: a correlation between the consumption of saturated fats and death from heart disease. However, it turns out he measured the diets of only 500 of these men, which some believed was hardly a representative sample. Moreover, some of the men were sampled during the 46-day religious holiday period of Lent, when meat in particular is strictly avoided.

Dr. Keys can also fairly be said to have cherry-picked his countries, selecting only those, such as Greece and Italy, that were likely to prove his beliefs, while avoiding others, such as France and Switzerland, where people consumed an abundance of saturated fats but suffered very little heart disease. These discrepancies weren’t known until much later, however. Meanwhile, the Seven Countries Study acted like the “Big Bang” of nutrition studies, solidifying expert opinion about dietary fat and heart disease for decades to come.

Other studies ensued, of course. A half dozen large, important trials pitted a diet high in veg-

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I particularly liked an article I recently read in the New York Times written by Dr. Aaron Carroll, a professor of pediatrics at Indiana University. Titled Dash of Salt Does No Harm. Extremes Are the Enemy, Dr. Carroll makes the point that too many of us in the health/nutrition community (as well as many lay people) fall into the trap of believing that if too much (or too little) of a particular nutrient is shown to be detrimental, then the opposite must be the safest dietary approach to pursue.

As an example, Dr. Carroll points to the long ongoing debate regarding dietary salt intake, and what constitutes a healthy intake for most people. He cites a recent study of populations in 18 countries that indicate those who consume more than 7 grams of salt per day have a greater risk of dying, and incur higher rates of heart attack, heart failure, and stroke, than those who consume 3-6 grams per day. Those relationships seem clear, and relatively uncontroversial. What’s interesting is how health organizations and many health professionals process this information to make their salt intake recommendations. The World Health Organization, for example, looks at numbers like these and recommends limiting salt intake to 2 grams per day. The American Heart Association suggests even more draconian intakes, recommending no more than 1.5 grams per day. The problem is that another recent study using the same dataset suggests that folks who consume less than 3 grams of salt per day have an even greater risk of dying than those who consume more than 7 grams per day!

In the case of salt intake, we’re all victims (or protagonists) of this “extreme” form of thinking: if a lot of something is bad, then it stands to reason that a little bit, or none, should be good. But very little related to diet and health is that cut and dried.

Dr. Carroll points to other nutrition-related dogma as examples of “extreme” thinking as well: the long-held belief that cholesterol intake should be minimized or completely removed from the diet because various studies indicate that elevated serum cholesterol may promote heart disease, despite the fact that for most folks dietary cholesterol does not move the needle on serum cholesterol much at all. Or, on the other end of the “extreme” scale, the practice of consuming very high doses of vitamins and minerals because it is known that vitamin/mineral deficiencies can cause serious health issues. At best, practices such as these may unnecessarily cost us a little extra money (in the case of excess vitamin intake), or lead to sub-optimal intakes of various micronutrients because of an unwarranted fear of dietary fat, leading to the shunning of otherwise healthy foods that contain cholesterol. At worst they can promote side effects and illness due to unnecessary use of drugs and other therapies designed to treat conditions that may not warrant treatment (in the case of mildly elevated serum cholesterol levels).

Why have so many of us, health professional and lay person alike, fallen victim to this sort of “extreme” thinking? There are no easy answers, of course. I’m inclined to think that our desire for quick fixes—simple black and white answers to issues that require a more nuanced response—has a lot to do with it.

Further, where diet is concerned, it’s probably natural for most of us to believe that more of something deemed “good” is better than less, and that a little bit of something deemed “bad” is worse than none.

And realistically, how is the public supposed to think or act when renowned health agencies provide guidance indicating that we shun or embrace certain foods or nutrients? This “picking sides” on foods that we should eat more or less of has led to erroneous recommendations in the past, and will surely do so in the future, as our understanding of the scientific literature evolves. Elsewhere in this issue of Close-Up, health writer Nina Teicholz looks at the issue of “extreme” dietary guidance from another angle, citing examples from her recent bestselling book The Big Fat Lie regarding our 50-year obsession with fat bashing, despite an evolving literature that indicates many of the early studies in the area may have been flawed.

As health professionals who dispense diet advice, we benefit by becoming as versed on nutrient recommendations as possible; by reading studies and assessing data on both sides of an issue; by not being swayed by headlines or, for that matter, the dogmatic recommendations of various health organizations and agencies. As Dr. Carroll points out, we need to stress “moderation” in our health and eating recommendations. With diets in particular, there is a lot of gray area, not as much black-and-white as we often like to think. Reflexively falling back on “extreme” dietary practices and advice is generally not the best approach. Critical thought seems a key component to healthy eating.

Mitch Kanter, PhD, has been Executive Director of Egg Nutrition Center since 2009.
Nutrition Close-Up

Economical eggs one answer to vitamin D deficiency

By Yanni Papanikolaou

While widespread cases of rickets date back at least to 17th century England, the cause remained elusive until McCollum and colleagues discovered vitamin D in 1957 and established a cure. While vitamin D research stalled for many years following that critical discovery, new research in recent years has reignited scientific interest in vitamin D and health outcomes. Low levels of vitamin D are now associated with various chronic diseases, including cancer, diabetes, osteoporosis, and cardiovascular disease. And the 2010 Dietary Guidelines for Americans indicated that vitamin D intakes are low enough to be considered a nutrient of public health concern for all ages. Even with the prevalent use of dietary supplements, observational evidence stemming from the National Health and Nutrition Examination Survey (NHANES) has shown that a significant number of American adults and children do not achieve the estimated average requirements (EAR) set forth by the 2010 Institute of Medicine (IOM) Food and Nutrition Board.

Exposure to the sun can influence vitamin D levels, and a high risk of vitamin D insufficiency exists in northern latitudes, among them northern regions of the U.S. In fact, researchers in 2007 examined vitamin D status of pregnant women and their neonates in and around Pittsburgh, PA, by race and season, where more than 90% of women used prenatal vitamins. At time of delivery, vitamin D deficiency occurred in 29.2% of African American women and 45.6% of their babies; while vitamin D insufficiency occurred in 54.1% of African American women and 46.8% of their babies. The study further showed that 5% of white women and 9.7% of their babies were vitamin D deficient; and that 42.1% of white women and 56.4% of their babies were vitamin D insufficient. The study confirmed that both groups of pregnant women residing in this northern U.S. region were at high risk of vitamin D insufficiency, even while more than nine in 10 complied with advice to consume prenatal vitamins. Similar findings have been reported in healthy young adults of diverse ancestry living in the Toronto area, situated about 60 miles north of the U.S. border, further demonstrating the impact of latitude on vitamin D status.

A recent study using data from NHANES 2001-2008 examined usual intakes of vitamin D from food and dietary supplements in individuals aged four years and greater. The study indicated that vitamin D disparities exist and are influenced by several demographic and/or socioeconomic factors, including race/ethnicity, income, and weight status. Percentages of individuals who did not meet their individual estimated average requirement (EAR) targets for vitamin D were high among all races. Individuals considered to have high household income had higher vitamin D intakes and were more likely to meet their EAR targets from a combination of food and dietary supplements compared to low- and middle-income individuals. Normal-weight individuals had greater calcium and vitamin D consumption and were more likely to meet the EAR targets from a combination of food and dietary supplements compared to overweight and obese individuals. Further, researchers indicated that “excessive intakes of vitamin D above the IOM’s Upper Limit value were low among all studied populations and overnutrification was not widely present across the analyses.”

Vitamin D can be sourced in the diet through consumption of fatty fish, fish oils, eggs, dairy products, and supplements. While fish represents an important source for vitamin D intake, fish consumption remains low in the U.S., making eggs and dairy foods favorable dietary alternatives to help increase vitamin D consumption. As part of a healthy diet, eggs can provide a good source of vitamin D, such that one large egg (50g) contributes 41 IU vitamin D. Currently, eggs fall under the category of “Protein Foods Group” in USDA’s MyPlate. Recommendations for the protein food group range from 2-ounce equivalents for children aged 2-3 years to 6.5-ounce equivalents for adolescent boys aged 14-18 years and adult men aged 19-30 years. One egg counts as a 1-ounce equivalent in the protein foods group. In addition, eggs are a nutrient-dense food and provide several key essential nutrients. At 70 kcal, one large egg contains 12% daily value (DV) for protein, 10% DV for vitamin D, 15% DV for riboflavin and 10% DV for phosphorus. In addition, eggs represent a food that collaborates well with other nutrient-dense food items. With that in mind, consider how the nutrition adds up when individuals choose egg-containing foods like low-fat cheese omelets and vegetable frittatas.

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Messages

- Low levels of vitamin D are now associated with various chronic diseases, including cancer, diabetes, osteoporosis, and cardiovascular disease.
- Individuals considered to have high household income and normal-weight individuals are more likely to meet their vitamin D intake targets through a combination of food and dietary supplements compared to low- and middle-income individuals and overweight individuals, respectively.
- One large egg contributes 41 IU vitamin D, contains 10% daily value for vitamin D, and collaborates well with other nutrient-dense food items.
Whether working with patients or clients, writing content for a newsletter, publishing a blog or simply talking with family and friends, a solid understanding of how to critically evaluate and translate new research is not only important, it’s a professional’s responsibility. An article discussing a “proven” nutrition and health link might make your internal alarm bells ring, but not necessarily so for the general public, particularly when some media outlets sensationalize headlines to attract readers.

As a health professional, separating evidence-based information from mass media hype is a skill that should be leveraged to help consumers differentiate sound information from misinformation. The following steps provide an overview of the research evaluation process, as well as tips for translating often complex information into meaningful consumer communications.

1. **Consider the source:** Peer-reviewed journal articles are treated with the highest regard because of the review process they must endure prior to publication. If you are unsure if an article is peer-reviewed, look for confirmation in the first few pages of a publication or website.

2. **Read the full text:** The research abstract is a nice snapshot of an article, but it is not a substitute for reading the full text. The abstract will only highlight the information the author finds most relevant or significant, while the full text will include a detailed discussion of the sample and methodology; a discussion of implications, including strengths and limitations of the study; as well as additional findings of interest and questions for further investigation.  

3. **Understand article type and study design:** Are you reading a research article or a review? In a research article, the authors write about the methodology of a new investigation and discuss the subsequent results. A review article is one in which the authors analyze a collection of data previously published by other researchers in order to identify trends and draw conclusions. Also, ask yourself if the research is observational or experimental? As the names imply, observational research involves the observation or examination of certain factors; experimental research involves an experiment, referred to as a treatment, on a group of subjects. Understanding the study design is a critical component of putting a research article into context. For example, an observational epidemiological study can only show associations between factors, whereas a randomized, double-blind, placebo-controlled experimental study can show cause and effect.

4. **Dissect the data:** Sample size is a key consideration in nutrition research. While a large sample size might provide data that is more generalizable to the broader population, the research can come at a prohibitive cost that narrows its scope. At the same time, do not automatically discredit a study because it has a small sample size. Instead, qualify results by keeping them in context. Also, evaluate characteristics of the small sample group, such as age range, gender, health status, education, or profession, and compare those to the broader population the authors are striving to characterize.

5. **Brush up on statistics:** Although statistical analyses can read like a foreign language, you don’t have to be a statistician to translate results. Statistical significance is most often reported using a measure called the p-value, where the numerical p-value represents reliability of results. Typically, a p-value of .05 or less is considered statistically significant. A resource from Cornell University Cooperative Extension summarizes this concept by explaining that a significance of p<.05 level means “we are 95% sure that there is a real difference between the two groups and that it is not due to chance.” The IFIC Review “How to Understand and Interpret Food and Health-Related Scientific Studies” (see References) includes an excellent glossary of statistical terms that can serve as a handy reference tool while reading.

6. **Know your reader (or listener):** The average reader will only retain a single message from the information shared, so a clear understanding of your target audience and the information they will find most applicable is critical. With target audience in mind, determine actionable suggestions that not only highlight key messages, but also place the larger body of evidence in context.

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**Messages**

- No matter the study design, remember that evidence-based nutrition advice is not based on a single study, regardless of strength of evidence.
- Read research articles in full (not just the abstract) and assess findings in the context of the investigation itself and within the larger body of evidence, paying close attention to study design.
- Translating scientific findings for the lay public requires the ability to explain a complex process in a succinct manner; narrow down evidence to the most impactful findings; and keep it in the context of the larger body of evidence.

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Nutrition Close-Up

Breaking common misperceptions about egg nutrition

By Nicole Hartnett

Egg farmers produce a wide variety of eggs to meet consumer demand. But more choices can lead to confusion and conflicting information in the minds of consumers. Understanding the scientific underpinnings of modern egg production enables health professionals to dispel misperceptions and help their clients make informed choices.

One of the most common egg-related questions concerns shell color, specifically brown versus white. Shell color has no effect on nutrient content as nutrient content is determined by the hen’s feed. The only difference is white-feathered hens lay white eggs and red-feathered hens lay brown eggs. Consumer research shows brown eggs are preferred primarily in the Northeast United States, while white eggs are preferred across the rest of the country. Brown and white eggs have virtually identical nutrient profiles, but studies show consumers perceive brown eggs to be more nutritious, have greater flavor and fat content, and believe they come from less conventional farm practices and organically-fed hens. Additionally, hens that lay brown eggs are slightly larger birds and therefore require more feed, which results in brown eggs being slightly more expensive than white eggs. This may also impact consumer perceptions around nutrition and quality.

America’s egg farmers produce eggs using a variety of production methods. Consumers may recognize USDA-defined terms such as “cage-free” or “free-roaming” eggs laid by hens in indoor floor operations; and “free-range” eggs that are laid by hens with access to the outdoors in accordance with weather, environmental or state laws.

Studies have been conducted to determine if housing and production methods affect nutrient quality. For example, a study that appeared in Poultry Science compared eggs produced by hens in conventional cages to free-range production facilities. The researchers compared fatty acid, cholesterol and vitamin A and E composition of the eggs. Caged eggs were produced in a conventional environment. Free-range eggs were produced by hens with access to the outdoors where they could forage for wild plants and insects.

Results of the study showed housing type had no effect on cholesterol, vitamin A or vitamin E content. Fatty acid composition, however, did vary between housing types: eggs from the free range production system had slightly higher total fat, monounsaturated fat, and polyunsaturated fat than eggs produced by caged hens. The research suggests that these differences in fatty acid composition reflect the free range hens’ access to wild seeds and insects.

In a similar study, researchers measured the fat composition of conventional eggs compared to certified organic as well as omega-3-containing eggs. All eggs were purchased from retail stores in a metropolitan area. Results showed little differences in the total fat content of eggs produced by conventional methods compared to organic or omega-3 eggs. However as would be predicted, omega-3 eggs contained a higher percentage of omega-3 fatty acids, specifically alpha-linolenic acid (ALA) and docosahexaenoic acid (DHA).

Egg size and grade are also two factors that can be a source of consumer confusion. The size of eggs sold (pee wee, small, medium, large, extra large and jumbo) is based on a minimum net weight expressed in ounces per dozen, according to USDA standards. There are small differences in the absolute nutrition profile based on variations in size. Medium, large and extra large are the sizes most commonly available in stores because hens most often lay eggs of these sizes. Grade (AA, A and B) is an entirely different factor that is determined by the interior and exterior quality of the egg at the time the egg is packed. There are no differences in nutritive value or freshness between the different egg grades.

With a multitude of food choices and an ever-expanding court of public opinion, health professionals should remain focused on science-based research to provide accurate information regarding food and nutrition. While clients will always have their own egg preferences, the preponderance of current research suggests that all types of hen-laid eggs offer high-quality protein with varying amounts of 13 essential vitamins and minerals.

The Egg Nutrition Center’s Guide to Egg Carton Labels includes common definitions and answers to questions regarding antibiotics, hormones, vitamin D and more. You can also virtually visit an egg farm through the Incredible Edible Egg’s YouTube channel, and meet America’s egg farmers firsthand to gain a better understanding of egg production.

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References

5. http://www.youtube.com/user/americaneggboard

Nutrition Close-Up
et able oil—usually corn or soybean—against one with more saturated fat and cholesterol. But these trials, mainly from the 1970s, also had serious methodological problems. Some didn’t control for smoking, for instance. Or they allowed participants to wander in and out of the study. The results, therefore, were unreliable at best. But so much money and institutional energy had been invested in Keys’ hypothesis that there was no turning back. A bias developed in favor of his idea, and contradictory data were ignored. The notion that red meat, cheese and eggs were damaging to health came to be accepted as “common sense” in the science community.

Keys and his colleagues managed to dominate the conversation about nutrition, excluding alternative ideas. As editors of the Journal of the American Medical Association wrote in 1967, an “almost embarrassingly high number of researchers boarded the ‘cholesterol bandwagon.’” It was an overly narrow “fervent embrace of cholesterol” to the exclusion of other biochemical processes that might cause heart disease.

Of course there were critics, including prominent scientists at the highest level. For instance, the National Academy of Sciences, reviewing all the evidence in 1985, concluded that the studies attempting to link dietary fat and heart disease had “generally unimpressive results.” And, as head of that group’s Food and Nutrition Board, Gil Leveille noted that Americans on butter, meat and eggs had been doing pretty well to date. Leveille added that the U.S. diet was “better than ever before and is one of the best, if not the best in the world.”

For instance, he noted, the average height of the American male—a reliable indicator of lifelong nutrition—had been fast rising throughout the first half of the twentieth century. Compared to countries with comparable statistics, Americans were among the tallest people on earth. And it’s worth noting that steady gains in height for Americans ceased in the late 1970s, coinciding with the first generation raised on a low-fat diet.

However, critics suffered near-certain retribution for challenging the conventional wisdom. They had trouble getting papers published, lost research grants, and were frozen out of expert panels.

“There was always a price to pay for going up against the nutrition establishment,” said Donald McNamera, a biochemist who took part in a pioneering team studying fat and cholesterol at Rockefeller University. McNamera witnessed members of that team lose funding and research opportunities for simply suggesting that anything other than fat and cholesterol might cause heart disease. McNamera later went on to serve as Executive Director of Egg Nutrition Center for 13 years (1995-2008).

“For a generation, research on heart disease has been more political than scientific,” lamented George Mann, a professor of biochemistry and prominent expert throughout the 1970s. Mann himself had been warned by a secretary at the National Institutes of Health that if he kept up his sustained criticism of the low-fat diet, he would lose his research grant, which he did.

In 1974, The Lancet, the prestigious international medical journal, sounded a note of alarm that would soon be picked up by others: “The cure should not be worse than the disease,” echoing the medical dictum, “First, do no harm.” Perhaps reducing fat in the diet might lead to an increase in carbohydrates, Lancet authors cautioned.

In fact, this is precisely what happened. Grains, pasta, rice and potatoes replaced meat, cheese, and eggs on dinner plates. Breakfasts of eggs and bacon ceded to bowls of cereal and orange juice. Americans today eat 11% fewer calories as saturated fats than they did 30 years ago, while increasing calories from carbohydrate by about 25%.

In recent years, many researchers have started to question the recommendations that have existed since the 1950s. Mounting evidence suggests that carbohydrates may influence body fat more than previously appreciated. Carbohydrates, especially the rapidly digestible type, stimulate the release of insulin, a hormone that not only regulates blood sugar, but also promotes storage of fat. Excessive carbohydrates may lead not only to obesity but also, over time, to type 2 diabetes and heart disease.

Meanwhile, it’s been known since the late 1970s that the cholesterol in eggs, shellfish and organ meats does not reliably cause heart attacks. Nearly every Western nation has therefore dropped their limits on dietary cholesterol in recent years. ¹

For 50 years now, saturated fats and cholesterol have been our primary dietary culprits. Yet, despite more than $1 billion spent, evidence of their dangers has never been produced. Meanwhile, rates of obesity and diabetes are rising, and heart disease remains a leading cause of death.

It’s worth wondering if our working hypothesis about diet and health is simply not working and if we should be considering alternative hypotheses instead.


Notes

¹ A joint expert panel of the American Heart Association and the American College of Cardiology, which took over the National Cholesterol Education Program’s job of drafting treatment protocols for heart disease, dropped its limit on dietary cholesterol in December 2013, stating that scientific evidence for it was lacking.

Messages

• The world’s first dietary guidelines for the prevention of heart disease in 1961 advised people to cut back on saturated fats and cholesterol as the best possible prevention, but the evidence for this recommendation appears weak. In the major study used to support this advice, the diets of fewer than 500 men were studied.
Economical eggs

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Based on peer-reviewed published findings, dietary guidance messaging may need to amplify recommendations to meet public health goals for vitamin D. Indeed, increased egg consumption may provide one realistic, practical, and economical approach for improved vitamin D consumption in several American sub-populations.

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References


Literature evaluation

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7. **Boil it down**: Explain complex topics succinctly and summarize key points in order to present the bottom line in a clear and concise manner. *The Academy of Nutrition and Dietetics also suggests avoiding obscure acronyms, technical terms and scientific jargon.*

**Kate G. Byers, MS, RDN** is a nutrition communications consultant and writer. She publishes the blog [Indulgent Wellness](http://indulgentwellness.com) and contributes to the blog [Smart Eating for Kids](http://smarteatingforkids.com)

References


Breaking common misperceptions

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**MESSAGES**

- A study comparing the nutrient quality of cage-free eggs to conventional eggs shows no difference in cholesterol, vitamin A or vitamin E, and slightly higher levels of total fat, perhaps due to hens’ access to seeds and insects.
- There is little difference when comparing the nutrition quality of cage-free eggs and conventional eggs.
- Egg size and grades can often be a source of consumer confusion, although there are no differences in nutritive value or freshness between the different egg grades.
Nutrition Close-Up

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ENC 2014 Fall Calendar

Health Professional Events

Academy of Nutrition and Dietetics Food & Nutrition Conference & Expo (FNCE®)
October 18-21, 2014 – Atlanta, GA
Educational Breakfast: Strategic Use of Protein Quality and Quantity to Enhance Satiety and Weight Management
Sponsored by ENC with the Weight Management, Diabetes Care and Education, Healthy Aging, Medical Nutrition Practice Group, Nutrition Educators of Health Professionals and Women’s Health Dietetic Practice Groups
Monday, October 20, 6:30-8:00 am
Speaker: Nikhil Dhurandhar, PhD, Pennington Biomedical Research Center

Osteopathic Medical Conference & Exposition (OMED)
October 23-29, 2014 – Seattle, WA
ENC-sponsored presentation: “Challenging Nutrition Dogma: New Research on Dietary Protein and Health”
Sunday, October 26, 12:15-1:00 pm
Speaker: Tia M. Rains, PhD

Obesity Week
November 2-7, 2014 – Boston, MA
Egg Nutrition Center’s Award Reception and Networking Breakfast*
Tuesday, November 4, 2014, 6:30-8:00 am
Speakers: Mitch Kanter, PhD and Nikhil Dhurandhar, PhD
*By invitation only

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

Nutrition Close-Up is a quarterly publication produced by the Egg Nutrition Center. Nutrition Close-Up presents up-to-date reviews, summaries and commentaries focused on the role of diet in health promotion and disease prevention, including the contributions of eggs to a nutritious and healthful diet. Opinions expressed by the authors may not be those of the Egg Nutrition Center.

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