Egg Nutrition Center
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Nutrition Close-Up

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EGG ALLERGENS

Changes in food allergy recommendations: a spotlight on egg allergens

By Apeksha Gulvady, PhD

Our present decade presents a very different food allergy landscape than it did about 35 years ago in terms of prevalence, types and severity of food-allergic reactions, diagnostic tools, and even recommendations for prevention. Take prevalence in the United States for instance. Although the rates of perceived prevalence have remained at around 20% through the ages, the actual incidence has gradually risen from <1% in the 1980s up to about 5% of the general population and 8% of U.S. children in recent years.[1-4] And while the number of individuals affected by food allergies continues to grow across the globe, particularly in developing countries, the United States alone accounts for as many as 15 million people with food allergies today.[1]

> *"Nearly 40% of children with food allergies have a history of severe reactions."*

Of the estimated 5.9 million U.S. children who have a food allergy, 30% have been found to be allergic to multiple foods. The most common allergenic foods include milk, egg and soy (which children are likely to outgrow); peanuts, tree nuts and shellfish (whose allergies are typically carried over into adulthood); plus, wheat and fish.[1,5] Even trace amounts of these foods have the potential to trigger a reaction ranging from a mild response, like coughing, to the more severe and potentially fatal anaphylaxis.[5] Nearly 40% of children with food allergies have a history of severe reactions.[4]

Food allergies can be classified as IgE-mediated, non-IgE, cell-mediated, or mixed IgE- and cell-mediated, with generalized, cutaneous, ocular, gastrointestinal, cardiovascular or respiratory symptoms.[2,6] Egg allergies, which are induced by egg proteins, can be IgE antibody-mediated or mixed IgE- and cell-mediated disorders, the former being more common in children.[7] Egg whites contain more than 20 different cross-reacting proteins and glycoproteins, which may bind to human immunoglobulin E (a class of antibodies found in mammals) to varying extents, and result in inflammatory reactions. Cutaneous symptoms have been found to be the most common reaction type, but gastrointestinal or respiratory tract manifestations have been reported as well.[6] In addition, mediation by different phenotypes of IgE, primarily conformational (3-dimensional) epitopes or sequential (linear) epitopes, can determine whether the egg allergy may be outgrown, or carried into adulthood, respectively.[6]

With no cures available for food allergies, management of the condition has traditionally largely focused on prevention of reactions. Thus far this has been achieved in three ways: strictly avoiding allergenic foods; adopting nutritional support; and prompt recognition of symptoms when

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Rec-i-pe: a medical prescription

By Rachel Bassler, RDN

According to Google, the archaic definition for the word "recipe" is "a medical prescription." As a registered dietitian nutritionist, I think this definition couldn't be more appropriate for how recipes should be thought of - a prescription to add nutritious and delicious food into one's dietary pattern.

There is huge consumer demand for recipes. The social media platform Pinterest is (almost) entirely dedicated to them. And recipes are a great vehicle to entice Americans to eat healthier, more nutritious foods.

> *Therefore, the Egg Nutrition Center has decided to launch a new recipe page, with recipe categories like Protein Powerhouse, Put an Egg on It, Mediterranean, Fueling Fitness, and more!*

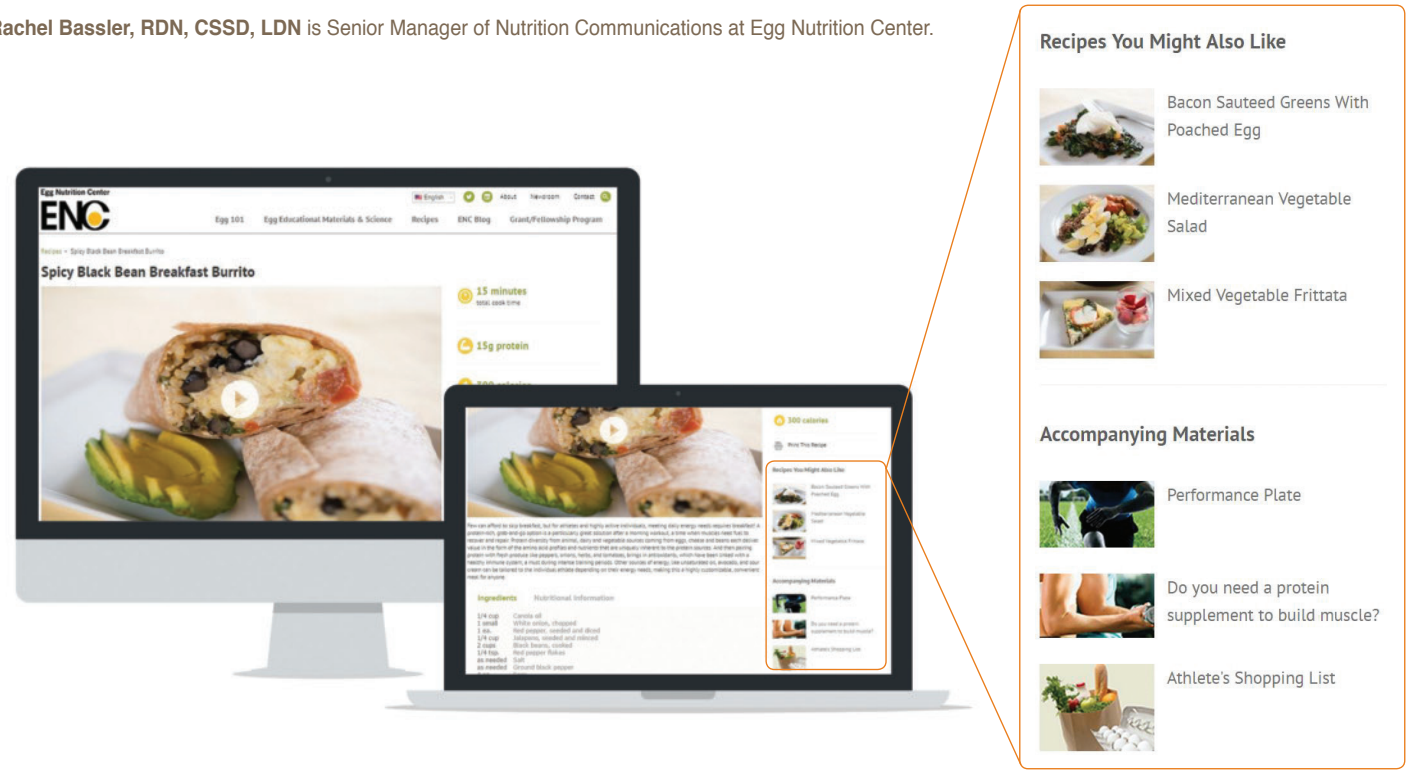
In order to be responsible and committed to overall health, we have been working to create nutrition criteria for the recipes that will be included and promoted on our website. Often times when health-oriented food brands and commodity organizations develop new recipes, they take into account the recommendations set forth by the Dietary Guidelines for Americans or health organizations, like the American Heart Association. In the past, these recommendations included very specific guidance on foods and nutrients, such as specific levels of nutrients to avoid. As such, sometimes nutrient-rich foods like unsaturated oils or eggs were difficult to include, since they would cause the recipe to exceed the threshold for total fat or cholesterol in recipe guidelines.

However, the 2015-2020 Dietary Guidelines, along with most health organizations, have shifted from food- and nutrient-focused dietary guidance to an emphasis on overall eating patterns. They note the importance of including a variety of healthy foods in the diet and offer other advice such as focus on fat quality versus quantity and not on a specific cholesterol limit, since recent studies show that it does not increase risk for heart disease.

ENC's recipe nutrition criteria will follow suit. Instead of focusing on specific levels of fat, cholesterol and other nutrients, we will ensure that each recipe includes nutrient-rich foods like fruits, vegetables, dairy, lean protein and oils, at appropriate amounts to help individuals eat a well-rounded meal or snack in moderation.

So stay tuned for tasty and nutritious recipes at www.eggnutritioncenter.org. And if you're ever interested in contributing a recipe or having one featured, please let us know!

Rachel Bassler, RDN, CSSD, LDN is Senior Manager of Nutrition Communications at Egg Nutrition Center.



Filling the gaps on 'Nutrients of Concern'

By Stacey Mattinson, RDN, LD

On January 7, 2016 the United States Department of Agriculture (USDA) and Department of Health and Human Services (HHS) jointly released the 2015-2020 *Dietary Guidelines for Americans* (DGA). These guidelines, updated every five years since 1980, provide guidance for health professionals and lawmakers on what constitutes a healthful dietary pattern, contrasts dietary and physical activity guidelines with current actual behaviors, and outlines a vision for the prevention of chronic diseases.[1] Included within the DGA are nutrients of concern.

Nutrients of Concern

Nutrients of concern include those underconsumed when compared to the Dietary Reference Intakes, including the Estimated Average Requirements (EAR) or Adequate Intakes (AI); and overconsumed compared to Tolerable Upper Intake Levels (UL) or other expert standards when an UL is unestablished.[1,2] Nutrients of concern as noted by the *Dietary Guidelines Advisory Council* (DGAC) pose particular public health risk. Chasms between national guidelines and intake were identified in the integrated federal food survey "*What We Eat in America,*" the dietary component of the National Health and Nutrition Examination Survey (NHANES). The intent and purpose of identifying nutrients of underconsumption and overconsumption is to reduce chronic disease risk and assist in meeting individual nutrient needs among Americans.

With approximately 17% of American children (ages 2-19 years of age) and 35% of American adults categorized as obese, it may be difficult for some to imagine the idea of "undernutrition" in America.[3,4] But nutrients commonly underconsumed in the U.S. include calcium, magnesium, potassium, choline, dietary fiber, and vitamins A, D, E, and C.[1,2] Iron is often underconsumed by females in adolescent years, while pregnant, or premenopausal.[1,2] The DGAC suggests that undernutrition of the aforementioned nutrients primarily occurs in the context of an overall poor dietary pattern with particularly limited intake of fruits, vegetables, whole grains and dairy.[1,2] A more accurate assessment, perhaps, would be to describe the population of the U.S. as largely overfed but undernourished.

Messages

- Even in a largely overfed US population, nutrients of concern for underconsumption include calcium, magnesium, potassium, choline, dietary fiber, and vitamins A, D, E, and C. Iron is often underconsumed by females.
- Eggs can be recommended with confidence as an excellent source of lean protein and an especially rich supplier of shortfall micronutrients.

Nutrients of concern for overconsumption are saturated fat and sodium.[2] It is recommended that saturated fats be reduced and replaced with mono- and polyunsaturated fats to reduce blood lipids and cardiovascular disease risk. Examples include cooking with plant oils, using nuts and seeds, incorporating fatty fish, and choosing lean meats, poultry, and non- or low-fat dairy. High sodium foods and food preparations may be replaced with lower sodium options and limited added salt in cooking to reduce risk of hypertension and cardiovascular disease.

Where do eggs fit?

Shifting the overall dietary pattern to consume more healthful, nutrient-dense foods is underscored in the latest DGA guidance. As healthcare professionals, our understanding of the nutrient profile of a number of foods is imperative to providing quality care. Eggs are a nutrient powerhouse, providing protein and a number of shortfall micronutrients. One large hard-boiled egg meets 27% and 35% of choline needs for men and women, respectively; 8% and 11% of vitamin A needs for men and women, respectively; 7% of female iron needs; 7% of vitamin D needs; and 4% of vitamin E requirements.[5,6] Minor contributions of magnesium and potassium are also made.[5] Protein was not identified as a shortfall nutrient by the DGAC, however it was noted that 6% and 11% of men and women, respectively, over 80 years of age did not meet minimum protein requirements.[2] In regard to this shortcoming among some older adults, one large hard-boiled egg provides 11% and 14% of minimum protein needs for these men and women, respectively.[5,6] Each large egg contains 1.6 grams of saturated fat (or 3.2 grams per 100 gram serving) and is therefore a lean protein by definition, with limited naturally occurring sodium (71 mg per large egg compared to the recommended ≤2300 mg daily).[5] Eggs can be recommended with confidence as an excellent source of lean protein and a supplier of several shortfall micronutrients without significant contribution of nutrients of concern for overconsumption.

Conclusion

The DGAC reports that approximately 117 million adults in the U.S., nearly half of the adult population, have one or more preventable chronic diseases, among them cardiovascular disease, type 2 diabetes, some cancers, and overweight or obesity related to poor diet quality and lack of adequate physical inactivity.[1] Gleaning from the *MyPlate* healthful eating pattern, healthcare professionals can encourage diets consistently replete with a variety of fruits, vegetables, whole grains, lean proteins, and non- or low-fat dairy or fortified soymilk, with limited salt, to assist Americans in reducing

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'Oh the thinks you can think' on pediatric obesity

By Bev Benda, RDN, LDN, BCC

Years ago I saw the Broadway show, *Seussical the Musical*.[1] It is based on two Dr. Seuss classics, *Horton Hears a Who* [2] about a sweet, gigantic elephant who befriends a dust-sized boy from a microscopic town, and *Horton Hatches the Egg*,[2] in which this same elephant guards his friend Mayzie's egg while she parties. The musical transcends these story lines as it shares the message of accepting people despite size or looks. Several characters face criticism, isolation, loneliness, and low self-esteem because they are "different." It comes full circle after showing how judgment hurts, and seeing beyond the surface creates true friendship and love.

As a Registered Dietitian, I couldn't help but realize that the key refrain, "*A person's a person no matter how small,*" could also have been, "*A person's a person no matter how big.*"

In a world that seems horrified by the "epidemic of obesity," many healthcare providers are quick to label people according to the Body Mass Index (BMI) as "normal," "overweight" or "obese." This tool has been given elevated status and a good medical billing code, so the scale greets patients quickly in the clinic. Never mind that sharing the BMI results may put parents and previously self-confident children in tears despite the medical oath of "do no harm."

Health care providers routinely tell children they are "too fat" and many parents are told to "keep an eye on it" (whatever *that* means). Children are encouraged to "eat healthier," as if they have control of the grocery cart, yet this advice has backfired according to the Academy of Pediatrics, who recently reported that this vague advice is confusing to families who are already eating balanced meals.[3] For older children this can lead to weight stigma, skipping meals and eating disorders. Overall, BMI monitoring has been mostly ineffective in making a positive impact on weight, and it is a turnoff to parents who want nonjudgmental conversations about their children.[4]

If Theodor Seuss Geisel were alive today, what would he think of the way children are classified by weight as young as the age of 2? Would he join the fight against pediatric obesity or would he search for an alternative voice, such as that of the Cat in the Hat?

Messages

- By branding children obese or overweight, we risk diminishing their self-esteem and placing them at a disadvantage during their most impressionable years.
- We must invest time and energy to explore new and better ways to improve children's health.

You've got a mind that is one of a kind, so why hide it away? It's time to open the locks and think out-of-the-box and today is your day! Bounce on the brink of whatever you think, and oh, what could be better than that? And that is the fun of The Cat in the Hat![5]

If we are to protect children and promote their health, perhaps we could be more like *The Cat in the Hat*. He is on the side of children. He does not target them, label them, or shake his head in disgust at them. To him, there is no such thing as an overweight or obese child. All children are simply precious and imaginative creatures like himself. Ask Horton and JoJo, who sing together, "*I have wings and I can fly around the moon and far beyond the sky.*"[6] Using People First language is a good place to start, identifying people by name, not disease. One request the Cat in the Hat might make is: "Could we please stop writing 'obese child' in the medical chart? How about 'delightful child who loves riding bike and reading books?'"

When we think out-of-the-box we can see that obesity isn't the main problem. It is merely one of many symptoms of much bigger issues: lack of physical activity, excess use of technology (TV, computer, iPad, phone, etc.), high stress, poor nutrition, lack of sleep, poverty, lack of education, lack of motivation, etc. Consider that not all children who have poor lifestyle habits are overweight or obese. Many are slender, perhaps due to a fast metabolism, but nonetheless, they often still suffer from poor nutrition, lack of fitness, poor dental health, TV and computer obsessions, sleep disorders, emotional stress, or addictions.

If we are ever to make any progress in the area of "pediatric obesity" we must stop acting like General

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Fight fat phobia

By Pamela Hernandez, CPT

In 1976 when U.S. Senator George McGovern convened hearings on the link between diet and disease, he started a chain reaction that led to dietary fat and cholesterol being assigned much of the blame for heart disease and obesity in America. In 1977 the government issued its first call for Americans to eat a low-fat diet. This led to a "fat phobic" diet industry boom in the 1980s, accompanied by a food manufacturing trend that flooded food stores with fat free substitutes for everything from coffee cake to American cheese.

Yet we didn't get any healthier. According to the Centers for Disease Control, heart disease is still the leading cause of death in the United States.[1] Study after study is indicating that we may have gotten it wrong and inadvertently made the problem worse by increasing consumption of refined grains, corn products and sugar. With the updated *Dietary Guidelines for Americans* 2015 -2020,[2] the government is trying to course correct, but it feels too little too late.

Most Americans, especially women, aren't getting the message that fat is not only okay to eat but a necessary part of a healthy diet. The idea that "Fat makes you FAT" is still shaping their dietary habits and stalling their efforts to lose weight and become healthier. Even as the diet industry is swinging now in the opposite direction (butter in coffee?), women still automatically reach for fat-free and low-fat versions of their favorite foods. Well-meaning corporate wellness programs still encourage consumers to limit "fatty foods" and recommend substitutes such as baked chips and bagels as "better for you" foods. Doctors are often unclear on how best to counsel patients on good nutrition for health and fat loss, and rarely take the time to track updates in nutrition science.

That usually means health and fitness professionals have to fill the gaps. Personal trainers, group fitness instructors, and health coaches can do this in three meaningful ways that are still well within their scope of practice.

Share the updated Dietary Guidelines for Americans with clients at every opportunity.

Gone is advice to use fats sparingly. A healthy diet includes up to 35% of its calories from fat sources, according to the Dietary Guidelines.[2] For a female consuming 1800 calories a day, that means up to 70 grams of fat per day. The Guidelines still suggest low-fat dairy products as a way to limit saturated fat, so encourage clients to choose these over their fat-free counterparts for satiety and satisfaction.

Teach which foods contain healthy fats and which fats to avoid.

Not all fat is created equal. Foods in their most natural state are always the better option. Our daily fat budget should be focused on a variety of whole food sources like nuts, seeds, eggs, fish and avocados. Be sure to point out food sources of omega 3 fatty acids, which are particularly heart-healthy.[2] Teaching clients how to read labels in order to identify and avoid trans fat, which the FDA has unequivocally found to be harmful,[3] is a valuable skill that will empower them to make meaningful changes toward a more heart-healthy diet.

Help clients understand the role of fat in the body for health and weight loss.

Fat performs many vital functions that may come as a surprise to clients. Sharing the importance of fat in the diet for utilization of fat-soluble vitamins like vitamin D and hormone production will help them make a positive association with what they may have once considered a forbidden food. Fat also has no impact on insulin production, providing an additional benefit to pre-diabetic and diabetic patients who are trying to regulate blood sugar.

Serving as a role model also goes a long way in alleviating fears about fat. Clients often ask me what I eat in hopes of learning a new eating pattern they can emulate. As fitness professionals, we are natural role models for clients, whether we intend to be or not. By consuming whole food fat sources as part of an active and healthy lifestyle, we give clients permission to do the same, further enhancing their ability to achieve the goals they strive to achieve.

Pamela Hernandez, CPT, is an ACSM Certified Personal Trainer and ACE Health Coach. She runs Thrive Personal Fitness in Springfield, MO and is the author of the new book "*Motivation Is Made Not Found.*" Pamela's goal is to empower women with fitness and help them take control of their lives by taking control of their health.

Messages

- Healthy diets today contain up to 35% of healthy fats, the best of which come from whole food sources.
- Serving as a role model for clients can help demonstrate how consumption of whole food fat sources fit within a healthy dietary pattern.

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Changes in food allergy recommendations: a spotlight on egg allergens

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accidental exposure occurs that is immediately followed by treatment.

However, strict avoidance of eggs may be challenging from both a nutrition and health perspective. Eggs uniquely combine nutrient density, affordability, availability, and versatility. One large egg provides 14 essential nutrients, including many shortfall nutrients, and as high-quality a protein source as exists. Moreover, the wide range of nutrients found in eggs gives them an important role in achieving an array of positive health benefits, including weight management, muscle strength, healthy pregnancy, brain function, eye health and more. Particularly in the case of pregnant or breastfeeding women, the choline, high quality protein, iron, and folate in eggs may help decrease rates of congenital abnormalities.

Messages

- With no cures available, management of food allergies has traditionally been focused primarily on prevention.
- Early exposure of the fetus to small quantities of egg allergens, via maternal consumption, may in fact induce tolerance to the allergen and thereby reduce risk of allergic reactions in early childhood years.

The American Academy of Pediatrics (AAP) had previously recommended that eggs should not be introduced until after two years of age in high-risk families, but the recommendation has since been withdrawn. The most recent AAP position is that "there is also little evidence that delaying timing of the introduction of complementary foods beyond 4-6 months of age prevents the occurrence of atopic disease." Thus, it is now generally accepted by the American Academy of Pediatrics that delaying the introduction of food allergens into an infant's diet beyond 4–7 months may be ineffective after all, and may in fact increase risk of allergy.[8] Importantly, the AAP recommends that food allergens should not be avoided during pregnancy or breastfeeding.[8] Recent research also supports the idea that early exposure of the fetus to small quantities of egg allergens, via maternal consumption, may in fact induce tolerance to the allergen and thereby reduce risk of reaction in the early childhood years.[9]

As the number of food allergy sufferers continues to grow, researchers are continuing to make great advances in developing new tools for diagnosis, uncovering the basis of food allergy mechanisms and tolerance. Further research can eventually help define the best management practices and hopefully find the much needed cure.

Apeksha Gulvady, PhD, is a nutrition scientist specializing in science-based communications for a broad range of food, nutrition and biomedical areas.

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'Nutrients of Concern'

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risk of chronic disease and improve nutritional adequacy. Healthcare professionals should be encouraged to become familiar with nutrient profiles of specific foods to assist clients in meeting shortfall nutrients when dietary intake is lacking.

Stacey Mattinson, RDN, LD founded Elevate Nutrition Consulting because, she says, "she's sick of seeing people who are sick." Stacey, a graduate of Brigham Young University, is currently completing her work toward a Masters of Science in Nutrition at Texas Woman's University. Stacey's business approach today is to prevent serious illness before it occurs.

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Eggstra! Eggstra! The latest research on egg nutrition

Early Introduction of Food Allergens

For years, health organizations and pediatricians recommended not giving infants (especially those at high-risk) food allergens – like eggs, peanuts, dairy or fish – as an introductory food, and at the same time, there was an increase in prevalence of food allergies in U.S. children. Now, current research has challenged that paradigm. Introducing allergen foods as early as 4 months (if not sooner), may actually decrease the child's risk of developing food allergies.

A new analysis published in The Journal of the American Medical Association found that, "Early egg or peanut introduction to the infant diet was associated with lower risk of developing egg or peanut allergy."

While the researchers of this study state that the conclusions are still preliminary and require additional research, the findings are not new. In fact, the National Academy of Medicine (formerly the Institute of Medicine) convened an expert committee to conduct a comprehensive review on food allergies based on the latest science, which is expected to be released in draft form next month. This report, and the research it cites, may reshape introductory foods for infants altogether.

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Benefits of a High-Protein Breakfast

Previous studies have demonstrated that higher protein meals at breakfast lead to greater feelings of fullness relative to lower protein breakfast meals, which may reduce energy intake and therefore facilitate weight loss (see ENC website for more information). Less understood is the effect of protein consumption at breakfast on the thermic effect of feeding (TEF), a component of total energy expenditure.

Dr. Jamie Baum at the University of Arkansas explored this question in 24 young women who habitually skip breakfast. Participants were randomized to one of three test breakfast groups for eight days: a carbohydrate-based breakfast (10 g protein, 350 calories), a protein-based breakfast (30 g protein, 350 calories), or no breakfast. The carbohydrate-based breakfast consisted of an English muffin with cream cheese, yogurt and water. The protein-based breakfast was described as "a proprietary breakfast sandwich, Greek yogurt, and water."

Participants consuming the protein breakfast showed a significantly higher TEF relative to the carbohydrate-based breakfast and breakfast skipping on both day 1 and day 8 of the study. There were no differences between the protein and carbohydrate breakfast meals on any of the subjective ratings of appetite. Interestingly, average daily energy intake was lower for the carbohydrate-based breakfast group relative to both the protein breakfast group and breakfast skippers based on three 24-hour food intake records.

According to the authors, "these data suggest that increasing protein at breakfast has beneficial effects on TEF in habitual breakfast skipping women in the short-term, but a longer adaption period may be needed."

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'Oh the thinks you can think'

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Genghis Khan Schmitz, the stern military general in *Seussical* who prided himself in being able to "*scare children out of their wits.*" He threatens that JoJo will have to "*sweat and shiver, and eat raw liver*" and he will not tolerate people who eat their bread "*butter side down;*" it must be eaten "*butter side up!*"[7] General Schmitz is the epitome of the "one-size-fits-all" intervention and belief that "we have a program for you." It's Butter Side Up (canned program) because in healthcare these days, we just don't have time for Butter Side Down (custom-made for you.)

Based on lack of progress in this area and evidence of harm (even increased bullying in schools toward children who are larger), it is obvious that we are putting our energy in the wrong places, and very possibly doing harm to children with our current practices. The Cat in the Hat is right: *It's time to open the locks and think out-of-the-box. And today is your day!*[5]

Bev Benda, RDN, LDN, BCC, has dedicated the last 30 years to public health, health promotion and health care. Through her web site www.mycoachbev.com she provides onsite and virtual services that include coaching, motivational presentations, and consulting.

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Health Professional Events:

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October 5-8—Boston, MA
ENC booth #318

Food and Nutrition Conference & Expo (FNCE)
October 15-18—Boston, MA
ENC booth #3037

American Heart Association Scientific Sessions 2016
November 12-16—New Orleans, LA
ENC booth #1151

We welcome your ideas!

Please send topic and
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