



DID YOU KNOW?

NEW RESEARCH IS EXPLORING HOW HIGHER MATERNAL CHOLINE INTAKES MAY HAVE LASTING BENEFICIAL COGNITIVE EFFECTS.

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SUSTAINABLE NUTRITION FOR WOMEN AND CHILDREN: EGGS AS PART OF THE GLOBAL SOLUTION

 by JEN HOUCHINS, PHD, RD



Inadequate nutrition is responsible for stunted growth in approximately 25% of children worldwide and the cause of nearly half of deaths in children under five years of age. In the context of the global focus to end hunger and ensure access to safe, nutritious and sufficient food, a recent Maternal and Child Nutrition supplement explores a unique opportunity to address stunting and malnutrition through improved access to and increased consumption of eggs. As stated by Lutter, "...eggs in the context of a healthy diet may be an efficient, sustainable, and scalable approach to improve maternal and child nutrition and rural development."¹

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SUSTAINABLE NUTRITION FOR WOMEN AND CHILDREN: EGGS AS PART OF THE GLOBAL SOLUTION

{ CONTINUED *from Front Page...* }

 by JEN HOUCHINS, PHD, RD

KEY MESSAGES

- A recent Maternal & Child Nutrition supplement provides new information about the opportunity to address stunting and malnutrition around the world through improved access to and consumption of eggs.
- Eggs are an important part of sustainable nutrition solutions, which consider health benefits in addition to economic, social and environmental outcomes.

Stunting is a significant problem in children <5 years of age in Ecuador, and the Lulun (Kichwa word for egg) Project developed, implemented, and tested a social marketing strategy that helped to re-define the community's understanding of infant nutrition and complementary feeding within a randomized controlled intervention trial.² This project considered culturally based norms, values, and local expectations, and the food-based intervention of one egg per day reduced stunting by nearly 50% in infants 6 to 9 months of age.³ The impact of this intervention is illustrated not only by the significant impact on growth, but also with participant feedback, "The egg is truly effective, and it is good for our children. Thank you for promoting campaigns to help people to know more about the egg."

Despite the high potential for eggs as a nutrition intervention in women and children, egg consumption is low in many parts of the world due to cultural, access and cost barriers. Data based

on nationally representative surveys conducted between 2007 and 2010 for women who had given birth in the last 3 years indicate "egg consumption was strongly related to socioeconomic status in a dose-response fashion with women in the lowest wealth quintile eating the fewest eggs and those in the highest wealth quintile eating the most."⁴ Similarly, "...the poorest families in low and lower middle income countries often rely on low-quality, plant-based diets consisting primarily of starchy staples, and novel approaches are needed to improve animal source foods availability and consumption in these settings."⁵

Novel approaches to help improve access and consumption of eggs in women and children is not straightforward and varies based on local cultures. Dumas et al. piloted an intervention to establish egg production centers in rural Zambian communities to increase availability of eggs in the local food system. This program improved egg production and offers a novel approach to improving access to eggs, but "optimization... is needed to ensure that egg consumption translates to improved dietary quality, growth, and health."⁵ Morris et al. separately concluded that there should be a focus on production practices that bring prices down significantly, allowing more poor households to access and consume eggs.⁶ A summary of key issues associated with small scale production indicates, "interdisciplinary research and development is required to ensure the long-term environmental and economic sustainability... that are a good fit with local circumstances."⁷

The articles in this recent supplement illustrate that "eggs are one of our best tools to help end



hunger, achieve food security, and improve nutrition.”⁶ However, access to eggs is not yet universal, and novel approaches are needed that address local cultures and circumstances. Importantly, sustainable nutrition includes evaluation of food and diet patterns not only in terms of health benefits, but also economic, social and environmental outcomes. We invite you to explore the most recent evidence of how eggs provide an opportunity to positively impact child and maternal nutrition, and all areas of sustainable nutrition.

Jen Houchins, PhD, RD

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CHOLINE – THE UNDERCONSUMED AND UNDERAPPRECIATED ESSENTIAL NUTRIENT

 by TAYLOR C. WALLACE, PHD, CFS, FACN

KEY MESSAGES

- Over 90% of Americans don't get enough choline. It is difficult to get enough choline without consuming eggs or taking a dietary supplement.
- New research is exploring how higher maternal choline intakes may have lasting beneficial cognitive effects.
- Additional public health recommendations are needed to help improve consumer and health professional awareness of choline.



“Recognition of the growing evidence relating inadequate intakes to health consequences coupled with evidence of suboptimal intakes in high-risk populations, warrants a need for improved public health

recommendations for choline” was the consensus of more than 40 experts attending the 2018 Choline Science Summit, whose findings were summarized recently in a feature article in the journal *Nutrition Today*.¹

Choline's role in human health begins prenatally and extends into adulthood and old age.² Its functions are complex and include, but are not limited to, neurotransmitter synthesis, cell membrane signaling, lipid transport and methyl group metabolism. Choline has been recognized as an essential nutrient in the U.S. and Canada since 1998; it has long been established that deficiency results in non-alcoholic fatty liver disease.

Choline's function and recognition among health professionals regarding cognition across the lifespan



has only recently gained momentum. Humans can produce small amounts of choline but must consume the nutrient through the diet to prevent deficiency.² The American Academy of Pediatrics (AAP) recently affirmed choline as a key nutrient to support neurodevelopment during the first 1000 days post-conception.³ Adequate maternal choline intake has been shown to help the baby's brain and spinal cord develop properly.¹ Additional research has shown that choline eases the baby's response to stress and enhances nutrient transfer across the placenta to the developing fetus.^{4,5} Importantly, lactation increases the maternal choline requirement.²

Higher maternal intake of choline results in lasting beneficial cognitive effects that become more pronounced with aging in both animal and human models. Results of a recent randomized controlled trial reveal benefits of higher maternal choline intake on child attention, memory and problem-solving that may last into the school-age years.^{1,6} Choline intake throughout adulthood may also help reduce the risk of age-related cognitive decline,⁷ however these findings are predominately based on observational studies or animal-models and more research is needed.

Analysis from the National Health and Nutrition Examination Survey indicates that the majority of the U.S. population is not consuming sufficient choline to meet recommended intakes. The daily value for choline is 550 mg per day, however estimated mean daily intake is approximately 319 mg per day.⁸ It is difficult to get enough choline without consuming eggs or taking a dietary supplement and therefore, it's not surprising that 90% of Americans and 92% of pregnant women do not achieve current recommended intakes for choline.^{8,9}

The bottom line – health professionals need to be aware of food sources of choline and while data indicate a need for Americans to increase plant-foods in the diet, this should not mean eliminating nutrient-dense animal-derived foods such as eggs that contain higher levels of choline. Health professionals should strongly consider the recommendations from the American Medical Association (AMA) and AAP, as well as the recent scientific literature summarized in this recently published report. Dietary guidance that helps all individuals meet current choline recommendations is critical for the health and wellbeing of all individuals.

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RECIPES

AMERICAN HEART ASSOCIATION CERTIFIED RECIPES



ENC is proud to share a collection of recipes that have been certified to meet the American Heart Association's heart-healthy nutrition requirements. Find this recipe and other heart-check certified recipes at: EggNutritionCenter.org/HeartCheckRecipes.



SPICY SRIRACHA BAKED AVOCADO

Ingredients

- 2 small avocados, halved and pitted
- 4 large eggs
- ¼ tsp. black pepper
- 1 tbsp. sriracha hot sauce
- 1 tbsp. finely chopped fresh cilantro

Directions

PREHEAT oven to 425°F. Line 8-inch square baking pan with foil. Scoop out some of the pulp from avocado halves, leaving hole big enough to fit an egg (reserve pulp for another use).

PLACE avocado halves in prepared pan to fit snugly in single layer. Fold foil around avocado halves to prevent tipping.

CRACK egg into each avocado half; season with pepper. Bake for 12 to 15 minutes or until whites are set and eggs are cooked to desired doneness. Let stand for 5 minutes before serving.

DRIZZLE each egg with hot sauce and sprinkle cilantro over top.

Heart-Check certification does not apply to scientific statements.

POWER OF THE FIRST 1000 DAYS: EARLY NUTRITION FOR LIFELONG HEALTH



by KATHLEEN ZELMAN, MPH, RDN

KEY MESSAGES

- Setting the stage early in life fuels growth while establishing good eating habits and reduces risk of developing chronic disease later in life.
- Brain development is augmented by the right mix of nutrients including choline, iron, and B vitamins.
- Complex interplay of micro- and macronutrients during the first 1000 days optimizes lifelong health, brain function and educational achievement.¹



Good nutrition is important at every stage of life but most dynamic and with the greatest vulnerability in the first 1000 days (pregnancy and the first two years). Researchers are connecting the impact of vital nutrients early in life with overall health, growth and neurodevelopment.

The first 1000 days establishes an imprint on the development of healthy tissues, organ structure and function for lifelong health.¹ Brain development is most rapid during the last trimester of pregnancy and the first 1000 days harboring the greatest opportunity to ensure normal development.

An emerging body of scientific evidence shows that providing essential building blocks during this crucial time period establishes a foundation of health across a person's lifespan and their predisposition to chronic diseases such as heart disease, obesity, diabetes, cancer and more.¹ This is, in part, because dietary habits, food preferences and behaviors are set early on and have the

potential to affect choices throughout life. Improving nutrition during the first 1000 days safeguards children to reach their full potential.

It Starts in the Womb

A mother's diet and lifestyle are critical to the infant's health. Following a healthy eating pattern and taking complete pre-natal vitamins is the best thing a pregnant woman can do to promote normal development of the baby.

Striking the right balance of proper nutrition sets the stage for good health whereas over or under nutrition can impact neurocognitive development and increase risks for metabolic syndrome, obesity and heart disease later in life.¹

- Emerging evidence has shown that early microbiota colonization may influence brain development and the occurrence of diseases later in life.^{2,3}
- Malnutrition early in life can lead to poor cognition and physical growth that ultimately impact the ability to learn and increases susceptibility to infection.⁴
- Some experts opine that the childhood obesity epidemic is in part due to maternal over-nutrition along with infant feeding practices.
- Studies have shown body mass index at two years of age is predictive of adult obesity.^{5,6}

Maximize the First 1000 Days

The American Academy of Pediatrics recommends exclusive breastfeeding for about the first



6 months with continued breastfeeding alongside introduction of complementary foods until 1 year.

Nutritional needs change early in life and are constantly changing to meet growth and development. Nutrients not provided during this period may result in poor cognition even with nutrient repletion.¹

Complementary feeding of a variety of foods including fruits, vegetables and single grains are recommended at 4-6 months of age. Baby's diet should be slowly advanced with variety and texture including cooked soft meat, poultry and seafood, beans, whole milk dairy and eggs.

Studies show that infant feeding practices influence food preferences and dietary patterns and can set the foundation for life long habits.⁷

Neurodevelopment

While all nutrients are important for brain development and overall growth, key nutrients during the first 1000 days are protein, polyunsaturated fatty acids, iron, zinc, copper, iodine, folate and vitamins A, D, B6 and B12.¹

Choline is a little-known nutrient that is under consumed yet vitally important to the functioning of all cells, and especially in the first 1000 days for brain development and the prevention of birth defects.⁸ Shockingly, 90-95 percent of pregnant women and 90 percent of adults don't consume adequate choline.⁹

Most multivitamins and prenatal supplements do not supply adequate choline. A recent study found none of the top 25 prenatal vitamins contain the 450 mg daily-recommended choline intake for a pregnant woman.¹⁰

As a result, the American Medical Association highlighted this underappreciated nutrient by recommending that all prenatal vitamins contain 450 mg -- the amount needed during pregnancy. Lactation requires 550 milligrams.

Closing the choline gap can be done with foods rich in choline such as eggs, beef liver, meat, seafood and wheat germ. Eggs are among the richest sources. Two large eggs contain 294 milligrams of choline, more than half the recommended amount for pregnant women.

Educating Caretakers

Since babies are totally dependent on caregivers for nourishment, educating them about the importance of appropriate infant feeding practices is essential. Messages should be targeted to adequate dietary patterns with clear and simple guidance. Utilizing digital and mobile technologies is an opportunity to promote healthy eating patterns for infants.

Guidelines for birth to twenty-four months has not been included in previous Dietary Guidelines for Americans (DGA) but this is about to change. The 2020 DGA will include recommendations for birth to twenty-four months for the first time.

Bottom Line

Good nutrition during the first 1000 days is a unique window of opportunity and tremendous chance to impact neurodevelopment and a child's ability to establish a healthy dietary pattern and lifestyle that will promote lifelong health.

Early intervention has the potential for enormous advantage across the life span. As dietitians, we have the capacity to improve early neurodevelopment and lifelong health with effective messaging and interventions.

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