# Research highlights 7 essential ingredients for healthy adolescents

August 25 2016, by Linda Milo Ohr

This month's article hits close to home for me as there are currently both a teen and a tween living in my house. And like the majority of this age group, my teen and tween are active in sports and academics, hungry throughout the entire day, and experiencing growth spurts right before my eyes.

Today's tweens and teens need proper nutrition for bone and muscle development, recovery from sports, cognition, and strong immune systems. Here is a look at some of the nutritional ingredients that may play beneficial roles during these developmental years (8–18 years), including protein, calcium, probiotics, prebiotics, whole grains, omega-3 fatty acids, and yeast beta-glucans.

## Protein

The amount of protein that adolescents need varies at different stages of development. As a rule, boys and girls between ages 11 and 14 need half a gram of protein per pound of body weight daily, according to information from the American Academy of Pediatrics' healthychildren.org. Between ages 15–18, the recommended dietary allowance (RDA) drops slightly. Protein should make up about 10%–12% of each day's calories.

Lean protein is necessary for muscle development as well as weight management and sports recovery for teens and tweens. Parents of teens

and tweens are increasingly incorporating lean protein into more snacks and breakfasts for their kids.

Leidy et al. (2015) showed that afternoon snacking, particularly on high-protein soy foods, improved appetite, satiety, and diet quality in adolescents, while beneficially influencing aspects of mood and cognition. Thirty-one healthy adolescents consumed the following afternoon snacks (in randomized order) for 3 days: a high-protein snack (26 g of protein/6 g of fat per 27 g of carbohydrates), a high-fat snack (4 g of protein/12 g of fat per 32 g of carbohydrates), and no snack. The results showed that consuming the high-protein snack, but not the high-fat snack, delayed eating initiation compared to not consuming a snack. Eating both snacks reduced appetite, but there were greater reductions with consuming the high-protein snack. Eating the high- protein snack also led to eating fewer high-fat/high-sugar evening snacks than when the high-fat snack or no snack was consumed.

Breakfast is reported as an important meal for all ages, but approximately 30% of adolescents skip breakfast every day and as many as 60% skip breakfast 3–4 times per week. Skipping breakfast is generally associated with weight gain, and more recently with cardio-metabolic risk factors and poor glucose control.

Bauer et al. (2015) suggested that the daily addition of a high-protein breakfast containing 35 g of high-quality protein has better efficacy at improving free-living glycemic control compared to a normal-protein breakfast in overweight/obese, but otherwise healthy, "breakfast skipping" adolescents. Twenty-eight healthy, but overweight, teens completed a 12-week randomized parallel-arm study in which they consumed either a 350 kcal normal-protein breakfast (13 g of protein) or a high-protein breakfast (35 g of protein).

The daily consumption of the high-protein breakfast tended to reduce

the 24-hour glucose variability versus the normal-protein breakfast, and the time spent above the high glucose limit. The consumption of the high-protein breakfast also reduced the 24-hour maximal (peak) glucose response and reduced postprandial glucose fluctuations.

## Dairy Foods

Dairy and dairy-containing foods contribute many essential nutrients including protein, calcium, vitamin D, vitamin A, vitamin B12, riboflavin, niacin, phosphorus, potassium, and magnesium. In the United States, milk and cheese are the top food sources for calcium, vitamin D, and potassium in the diets of adults and children. Adolescents tend to most often fall short of their daily quotas of calcium, iron, zinc, and vitamin D, which is important for bone health and calcium absorption, muscle strength, and immunity.

## Whole Grains

Whole grains, which contain all of their original bran, germ, and endosperm, are an important source of many essential nutrients, such as fiber, protein, magnesium, and iron. "The nutrients found in whole grains, which are essential at any age, may be especially beneficial for teenagers in particular," notes Kelly Toups, program director at Oldways Whole Grains Council, Boston, Mass. (wholegrainscouncil.org). "In a 2016 study in Pediatrics (Farvid et al. 2016), Harvard researchers found that every 10 g of fiber in adolescence and young adulthood was linked with a 14% and 13% lower risk of later breast cancer, respectively, and that the young women eating the most fiber in adolescence and young adulthood (25 g/day) were 25% less likely to get breast cancer than those eating the least fiber (12 g/day). Given that many whole grain foods are a good source of fiber, this study demonstrates the lifelong importance of whole grain and high-fiber foods for tween and teen girls." In addition,

Toups cites a 2015 study in Health Affairs suggesting that whole grains may be particularly important for preteens struggling with their weight. "After analyzing the food records and BMI of more than 4,600 British children at ages 7, 10, and 13, the researchers found that whole grains were the only food group to be consistently linked with weight loss."

Ptomey et al. (2016) demonstrated that both breakfast consumption and the content of the breakfast meal may be associated with improved standardized test performance in elementary school students. Baseline data were collected from 698 students. The researchers found that greater servings of whole grains at breakfast were significantly related to higher scores in reading comprehension and fluency and math.

Americans are still falling short of the recommended whole grain intake, teens and tweens included. "After analyzing national health survey data (NHANES), Minnesota researchers found that in 2012, less than 1% of kids ages 6–18 were meeting the recommendation for whole grains (about 3 oz equivalents per day)," says Toups. "However, kids' whole grain consumption has improved from 2001–2012, increasing from 0.56 oz equivalents in 2001 to 0.74 in 2012. The researchers also found that those eating the most whole grains had a lower BMI and waist circumference, and were less likely to be overweight or obese."

## Omega-3 Fatty Acids

Omega-3 fatty acids have been shown to benefit heart health and are thought to also help in cognition. van der Wurff et al. (2016) looked at the possible association between omega-3 long chain polyunsaturated fatty acids in blood and cognitive performance of 266 typically developing adolescents aged 13–15 years. Baseline data from Food2Learn, a double-blind and randomized placebo-controlled krill oil supplementation trial in typically developing adolescents, were used for the study. The results revealed a possible indication for a higher

information processing speed and less impulsivity in those with a higher omega-3 index.

## Probiotics

Probiotics have been shown to play a role in both immunity and digestive health for teens and tweens. DuPont Nutrition & Health, New Century, Kan. (dupont.com), offers HOWARU Protect, clinically documented probiotics formulated for kids. The unique proprietary probiotic formulation consists of Bifidobacterium lactis Bi-07 and Lactobacillus acidophilus NCFM. Leyer et al. (2009) showed that supplementation for 6 months supported respiratory health with symptom duration shortened from 6.5 to 3.5 days. The results also showed a strong reduction in antibiotic use and a reduced number of sick days.

## Prebiotics

Prebiotics benefit digestive health but also have been shown to aid in calcium absorption. This is important for tweens and teens. BENEO, Morris Plains, N.J. (orafti.com), offers Orafti Syngergy1 oligofructose-enriched inulin. The bacterial fermentation of the prebiotic increases the absorption capacity for calcium by extending the absorption capacity to the large intestine.

Whisner et al. (2014) suggested that moderate daily intake of soluble corn fiber (SCF) from Tate & Lyle, Decatur, Ill. (tateandlyle.com), increased short-term calcium absorption in adolescents consuming less than the recommended amounts of calcium. Twenty-four adolescent boys and girls (12–15 years) participated in two 3-week metabolic balance studies testing 0 g/day of SCF and 12 g/day of SCF by inclusion in a low-calcium diet (600 mg/day). The results showed that fractional

calcium absorption was 12% higher (41 mg/day) after the SCF treatment compared with that after the control treatment.

Daily consumption of 5 g of galacto-oligosaccharide (GOS) also increased calcium absorption, which may be mediated by the gut microbiota, specifically bifidobacteria, in healthy adolescent girls (Whisner et al. 2013). A total of 31 healthy adolescent girls aged 10–13 years consumed smoothie drinks twice daily with 0, 2.5, or 5 g of GOS for three 3-week periods in a random order. Significant improvements in calcium absorption were seen with both low and high doses of GOS compared with the control, but it was not a dose–response relationship. Fecal bifidobacteria increased with the GOS treatment.

## Blueberries

Whyte et al. (2015) demonstrated cognitive improvements in children aged 7–10 who consumed wild blueberries. Using a double-blind crossover design, children consumed blueberry drinks containing 15 g or 30 g of freeze-dried wild blueberry powder or a placebo on three occasions. A cognitive battery including tests of verbal memory, word recognition, response interference, response inhibition, and levels of processing was performed at baseline and at 1.15, 3, and 6 hours following treatment. Across all measures, cognitive performance improved, consistent with a dose-response model, with the best performance following consumption of 30 g of wild blueberry powder and the worst following consumption of the placebo.

## Yeast Beta-Glucan

A natural yeast beta 1,3/1,6 glucan derived from the cell wall of a highly purified, proprietary strain of baker's yeast (Saccharomyces cerevisiae), Wellmune from Kerry Ingredients, Beloit, Wis. (wellmune.com), is an

immune-boosting ingredient that triggers human defenses. It primes and strengthens the key immune function of neutrophils.

Recently, Wellmune has been shown to help keep children significantly healthier by decreasing episodes of common childhood illnesses and symptoms of illness such as upper respiratory tract infection symptoms, according to a study conducted by H&J CRO International, Beijing (Kerry Ingredients 2016). The study findings showed that 62% of the children who took Wellmune reported "good" health status compared to only 15% of the children who took a placebo. The study also found that the children who took Wellmune had two-thirds fewer upper respiratory tract infections and six fewer sick days over a 12-week period.

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Provided by Institute of Food Technologists

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