

FEEDING THE YOUTH ATHLETE – THREE KEY MESSAGES

KARINA CHRISTOPHER, PHD, RND, LD

BACKGROUND

Working with athletes under the age of 18 requires navigating complex socioeconomic, developmental, and environmental factors that influence food intake. Foods easily purchased by one family may be impossible to access for another family. Developmentally, this age group seeks information about food from their parents or guardians but are strongly influenced by their peers. Unfortunately, these sources of information can often be inaccurate or inappropriate for the individual. Additionally, many youth athletes are enrolled in school while they participate in a sport, which can prevent access to snacks throughout the day and limit consuming adequate nutrient consumption for their sport. Finally, regardless of participation in sport, this age group is less likely to meet the recommendations for nutrient intake for their distinct growth and development (8,12).

According to the Youth Risk Behavior Survey Data, 52% of high school students participate in a sport either at their high school or as part of a community group (2). Participation in sports can provide the same benefits that it does for people of all ages, such as improved mental, emotional, and social health; educational success; and decreased chronic disease risk (11). It is important for individuals working with youth athletes to educate them on the role nutrition plays in improving sports performance and how it positively impacts future healthy eating behaviors. Drawing from both the scientific literature and applied practice, this article identifies three fundamental nutrition strategies that consistently support athletic performance. Strength and conditioning coaches can help athletes optimize performance by emphasizing: 1) what you drink matters, 2) incorporate more plant-based foods, and 3) eat breakfast consistently.

WHAT YOU DRINK MATTERS

Youth athletes have a greater risk of dehydration than adult athletes. Some of this risk is because youth have greater surface area-to-body mass ratio, which makes them more likely to have a higher body temperature within their environment (4). They also produce more metabolic heat per unit mass. While they may have lower sodium losses in their sweat, they do not necessarily need a sports drink for rehydration. Developing a preference for plain water should be the foundation of hydration practices for youth athletes. For athletes who find plain water less appealing, flavor can be enhanced by infusing it with fresh fruit or herbs, while also providing small amounts of vitamins and other beneficial nutrients. Electrolyte powders may also improve palatability when appropriate. Strength and conditioning coaches and parents can further encourage hydration by making water more engaging. For example, by freezing pureed or chopped fruit in ice cube trays and adding the fruit-infused ice cubes to reusable water bottles. Youth athletes should consume sports drinks for long duration activity or extreme temperature environments due to the increased loss of electrolytes from sweat (7). Sports drinks can be used as a

recovery drink to replace glycogen stores (7). Youth between the ages of 9 – 18 years need to consume at least 2 – 3 L of fluid per day (4,7). This may increase if they are exercising in extreme temperatures. A good rule of thumb is to bring at least 20 oz of water to consume during activity and have another 20 oz of water ready to drink after the activity. While weighing before and after activity can be problematic in some, knowing how much fluid is lost during activity can help guide the amount of fluid to be consumed after the activity. For every pound of fluid weight lost, at least two cups of fluid should be consumed.

Another beverage frequently recommended is chocolate milk or a chocolate milk alternative. Its composition of carbohydrate, protein, calcium, phosphorus, vitamin A, and vitamin D make it an excellent recovery beverage. Chocolate milk is as effective at improving overall strength as other recovery supplement drinks (1). Chocolate milk is a recovery drink that is accessible for athletes across socioeconomic status due to its low cost and abundant availability. Families can purchase chocolate milk in bulk or individual, shelf-stable containers.

In contrast, energy drink consumption warrants caution, particularly among youth athletes. Energy drinks are marketed to adolescents and often contain more caffeine than traditional sources, such as coffee. An average eight-ounce cup of coffee contains approximately 95 mg of caffeine, while many commercially available energy drinks provide 150 mg or more per serving (5). Caffeine is one of the most researched ergogenic aids and has been shown to improve endurance, repeated sprint performance, reaction time, and perceived effort in adult athletes when consumed in appropriate doses before exercise or competition (6). However, these findings are based primarily on adult populations and should not be applied to youth. Current recommendations from pediatric and sports medicine organizations advise against caffeine use as a performance-enhancing strategy in individuals younger than 18 years because of limited evidence of benefit and concerns regarding safety.

Athletes should avoid increasing caffeine intake during practices or competitions to enhance performance. Consuming additional caffeine without understanding individual tolerance or total daily intake may result in undesirable side effects including jitteriness, gastrointestinal distress, elevated heart rate, anxiety, and impaired decision-making, which can negatively affect both physical performance and sport-specific skills (5). Caffeine intake in youth has been associated with adverse effects including sleep disruption, anxiety, impaired concentration, elevated heart rate, chest pain, and palpitations. Recent evidence also suggests that youths consuming more than 100 mg of caffeine per day are at greater risk for attention disorders, chest pain, difficulty breathing, and rapid heart rate (5). Strength and conditioning coaches should educate athletes and their families about the caffeine content of energy drinks and discourage their use as a performance aid.

INCLUDE MORE PLANTS

Plant foods like fruits, vegetables, legumes, nuts, seeds, and whole grains can be power packed options for young athletes. The more deeply and richly colored the plants they consume, the more benefit they will receive for their body. Whole grains and legumes provide complex carbohydrates, which are important for fueling their sport and allowing other nutrients to support growth and development. Whole grains and legumes also contain high amounts of fiber, slowing down the digestion of carbohydrates and providing more sustained energy throughout the day. Increasing dietary fiber can be achieved by incorporating more fruits, vegetables, whole grains, legumes, nuts, and seeds into meals and snacks. Strength and conditioning coaches can provide athletes with practical, performance-friendly snack ideas, such as snap peas or carrots with hummus, banana slices with nut butter on whole-grain bread, or oatmeal topped with nut butter, dried fruit, and a drizzle of honey. These nutrient-dense options not only increase fiber intake but also provide carbohydrates, healthy fats, and micronutrients that support training, recovery, and overall health. Strength and conditioning coaches can also encourage healthy eating habits through team-based nutrition activities. For example, athletes can contribute individual ingredients, such as unsalted nuts, seeds, whole-grain cereal, or dried fruit, to prepare a shared trail mix. Involving athletes in selecting and preparing nutritious snacks can increase exposure to a wider variety of foods, promote positive nutrition behaviors, and foster team engagement.

Legumes are also a great addition to the nutrition plan because they supply protein. Some legumes like edamame and chickpeas can be a quick and easy snack for athletes who need to increase their protein intake throughout the day. In addition to legumes, nuts and seeds are a good source of protein and healthy fats. They are shelf stable options for athletes to pack and consume in school. Due to the high incidence of nut allergies in this age group, allergy-friendly options like sunflower seeds, pepitas, and sun butter could be substituted. The healthy fats found in nuts and seeds are very important for brain development in this age group.

Fruits and vegetables are packed full of vitamins and minerals that support growth, development, metabolism, and the immune system. At meals, athletes should aim for at least half of their plate to contain fruits and/or vegetables. While there are a variety of vitamins and minerals found in fruits and vegetables, there are three of particular interest among youth athletes: iron, calcium, and vitamin D. Iron deficiency anemia is the most common nutritional deficiency in the world (10). Specifically in athletes, low iron stores can lead to reduced athletic and aerobic performance (10). In athletes, the chance of iron deficiency is higher in girls than in boys due to the menstrual cycle (13). Boys should consume 8 – 11 mg of iron and girls should consume 8 – 15 mg of iron daily (13). Good sources of iron include meat, fish, poultry, eggs, legumes, and dark leafy green vegetables. To increase absorption of iron, individuals should eat foods high in vitamin C at the same

time (7). Good sources of vitamin C include oranges, sweet red peppers, broccoli, strawberries, and Brussels sprouts.

Calcium is another mineral which requires high consideration. Between the ages of 9 – 18, there is incredible growth that occurs in the bones. Physical activity, particularly weight-bearing, can improve the bone mineral density of adolescents and further impact their future bone mineral density. During this phase of development, calcium needs at this age increase to 1,300 mg per day (7). While many can obtain this mineral in dairy foods, it is important to note that dark leafy greens, tofu, almonds, sardines, and fortified foods also contain calcium. In many cases, calcium-rich foods also contain phosphorus and magnesium, which are also important for bone mineralization and muscle contraction.

Vitamin D is necessary for absorption and utilization of calcium in the body. While many athletes can obtain vitamin D through ultraviolet B (UVB) exposure, those living in areas outside of optimal sunlight exposure and of darker complexion can be at higher risk. In addition, wearing sunscreen blocks UVB exposure which, in turn, prevents vitamin D absorption (7). Seafood, fortified dairy foods, and fortified cereals are a good source of vitamin D. Adolescents should aim for five micrograms of vitamin D per day (7).

EAT BREAKFAST

It is common for the youth athlete's first meal of the day to be delayed until late morning or even early afternoon. This pattern is often compounded by insufficient sleep resulting from excessive evening screen time, irregular sleep schedules, and demanding academic and athletic commitments. Sleep is a critical component of recovery and athletic development, yet many adolescent athletes fail to obtain the recommended 8 – 9 hr of sleep per night (3). Insufficient sleep has been associated with delayed reaction time, impaired attention and memory, mood disturbances, increased perceived exertion, reduced time to exhaustion, and an elevated risk of musculoskeletal injury (3). These performance deficits can limit an athlete's ability to train effectively, recover between sessions, and consistently perform at a high level (3). Furthermore, electronic media use before bedtime has been shown to reduce both sleep quantity and sleep quality, making healthy sleep hygiene an important component of an athlete's overall performance plan (3).

Breakfast provides an important opportunity to replenish energy stores following the overnight fast and supply the carbohydrates, protein, vitamins, and minerals needed to support both cognitive function and physical performance throughout the day (14). Athletes who consistently eat breakfast are better positioned to meet their daily energy and nutrient requirements, particularly when training or competition occurs later in the day. For athletes with early morning practices, arriving completely fasted may compromise training quality, especially when inadequate sleep has already impaired alertness, concentration, and perceived readiness to perform. Strength and conditioning coaches can reinforce

FEEDING THE YOUTH ATHLETE – THREE KEY MESSAGES

simple sleep hygiene habits, such as minimizing screen use before bedtime, maintaining a consistent sleep schedule, and prioritizing adequate nightly sleep, to improve recovery and increase the likelihood that athletes wake with sufficient time and appetite to consume breakfast before school or training.

For athletes with early morning practices, arriving completely fasted may compromise training quality and increase perceived effort. When a full meal is not practical, athletes should be encouraged to consume a small carbohydrate-rich snack before activity, such as applesauce, a granola bar, dry cereal, fruit snacks, a banana, or rice cakes. Following training, a balanced breakfast containing carbohydrate and high-quality protein can support glycogen replenishment, muscle repair, and recovery.

Although the Dietary Reference Intakes recommend 34 g of protein per day for individuals 9 – 13 years of age and 52 g per day for those 14 – 18 years of age, these recommendations are intended for generally healthy youth and do not account for the increased physiological demands of sport participation (9). Evidence suggests that young athletes may benefit from protein intakes of approximately 1.2 – 1.6 g/kg/day to support training adaptations, recovery, and growth (4,7). Achieving these targets is more feasible when protein intake is distributed consistently across meals and snacks, making breakfast an important opportunity to begin meeting daily protein needs.

Breakfast also contributes substantially to daily energy availability. Chronic low energy intake can impair growth and maturation, delay puberty, disrupt menstrual function in female athletes, compromise bone health, reduce training adaptations, and increase the risk of illness, injury, and disordered eating behaviors (4). By encouraging consistent breakfast consumption alongside healthy sleep habits, strength and conditioning coaches can help youth athletes establish behaviors that support long-term health, recovery, and athletic performance.

CONCLUSION

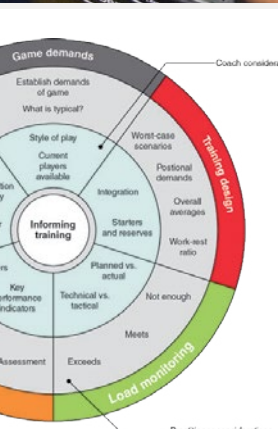
Balancing the demands of growth and development, sport-specific training, and daily life can be challenging for youth athletes. Building a strong foundation of healthy eating behaviors can support both athletic success and the development of lifelong nutrition habits. Reinforcing these three key messages to youth athletes provides a starting point for building sport-specific knowledge and increasing confidence in meeting the physiological demands of training and competition.

REFERENCES

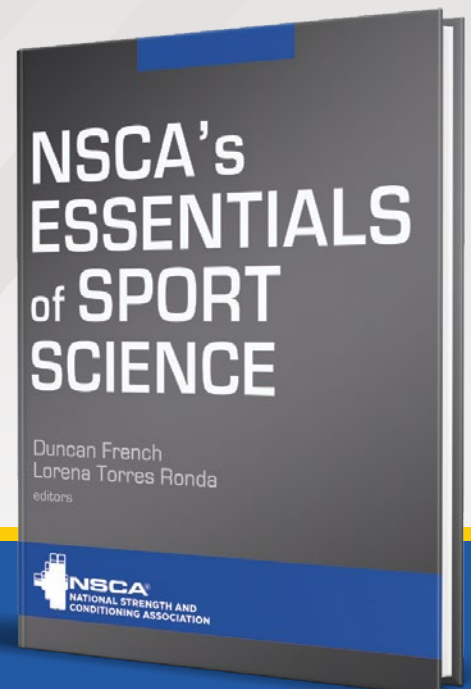
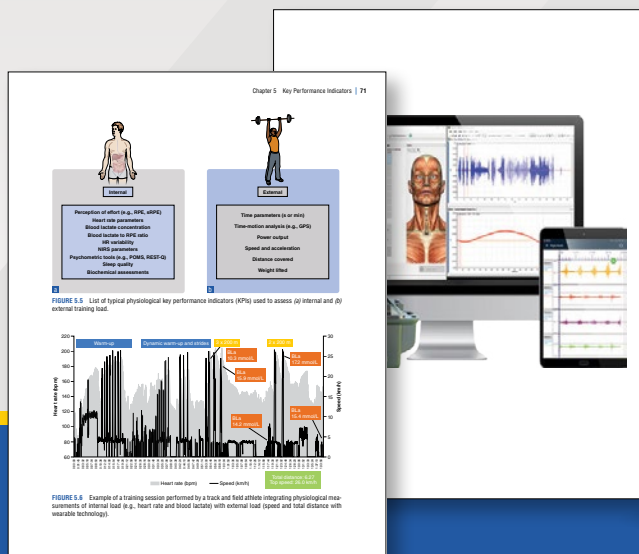
1. Born, K, Dooley, E, Cheshire, P, McGill, L, Cosgrove, J, Ivy, et al. Chocolate milk versus carbohydrate supplements in adolescent athletes: A field based study. *Journal of the International Society of Sports Nutrition* 16(1): 6, 2019.
2. Centers for Disease Control and Prevention. Youth risk behavior survey data summary and trends report for dietary, physical activity, and sleep behaviors: 2013-2023. U.S. Department of Health and Human Services. 2025. Retrieved 2026 from <https://www.cdc.gov/yrbs/dstr/pdf/dstr-dietary-physicalactivity-sleepbehavior2013-2023-508.pdf>.
3. Coel, R, Pujalte, G, Applewhite, A, Zaslow, T, Cooper, G, Ton, A, et al. Sleep and the youth athlete. *Sports Health* 15(4): 537-546, 2022.
4. Desbrow, B, McCormick, J, Burke, L, Cox, G, Fallon, K, Hislop, M, et al. Sports Dietitians Australia position statement: Sports nutrition for the adolescent athlete. *International Journal of Sport Nutrition and Exercise Metabolism* 24: 570-584, 2014.
5. Farber, J, Dikdan, S, Ruge, M, Johnson, D, and Shipon, D. Relationship between caffeine consumption and young athletes' comorbidities, exercise-related symptoms, and baseline electrocardiogram. *Sports Health* 16(3): 448-456, 2024.
6. Guest, NS, VanDusseldrop, T, Nelson, M, Grgic, J, Schoenfeld, B, Jenkins, N, et al. International Society of Sports Nutrition position stand: Caffeine and exercise performance. *Journal of the International Society of Sports Nutrition* 18(1): 2021.
7. Hecht, C, Bank, N, Cook, B, and Mistovich, R. Nutritional recommendations for the youth athlete. *Journal of the Pediatric Orthopaedic Society of North America* 5(1): 599, 2023.
8. Iannotti, R, Wang, J. Patterns of physical activity, sedentary behavior, and diet in U.S. adolescents. *Journal of Adolescent Health* 53: 280-286, 2013.
9. Institute of Medicine. Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids. The National Academies Press. 2005. Retrieved October 2025 from https://books.nap.edu/openbook.php?record_id=10490.
10. Keller, K, Friedrich, O, Trieber, J, Quermann, A, and Friedmann-Better, B. Iron deficiency in athletes: Prevalence and impact on VO2 peak. *Nutrition* 126(112516): 2024.
11. President's Council on Sports, Fitness and Nutrition Science Board. PCSFN Science Board Report on Youth Sports. Proceedings from the 2020 Annual Meeting of the President's Council on Sports, Fitness and Nutrition. Retrieved October 2025 from <http://www.health.gov/our-work/pcsfn/about-pcsfn/science-board>.
12. Rosenbloom, C. Youth athletes: Nourishing young bodies and minds. *Nutrition Today* 51(5): 2016.
13. Shoemaker, M, Gillen, Z, McKay, B, Koehler, K, and Cramer, J. High prevalence of poor iron status among 8- to 16-year-old athletes: Interactions among biomarkers of iron, dietary intakes, and biological maturity. *Journal of the American College of Nutrition* 39(2): 155-162, 2020.
14. Stratton, M, Holden, S, Davis, R, and Massengale, A. The impact of breakfast consumption or omission on exercise performance and adaptations: A narrative review. *Nutrients* 17: 2, 2025.

ABOUT THE AUTHOR

Karina Christopher has been a Registered Dietitian Nutritionist (RDN) for 20 years. She completed her undergraduate degree in Food and Nutrition at Northwest Missouri State University and her Master's degree in Community Nutrition at Eastern Kentucky University. Following her dietetic internship through Eastern Kentucky University, she worked as a clinical dietitian for eight years. Since obtaining her Doctorate in Gerontology from the University of Kentucky, she has worked in academia teaching medical nutrition therapy, human nutrition, food preparation, and sports nutrition. In addition to her work in academia, Christopher has also provided sports nutrition counseling to youth and collegiate athletes for over 10 years.



PREPARE WITH CONFIDENCE FOR THE CPSS® EXAM



ORDER YOUR COPY TODAY »
at **NSCA.com**

