

State of the Science: Student-Athlete Feeding



College is an exciting and challenging time of life. For student-athletes, the challenge is compounded by the demands and stress associated with training and competition. Many student-athletes devote 20 hours each week to their sports¹; add to those demands time for classes, study sessions, meals, social life, and sleep, and it's easy to understand that many college-athletes lead hectic lives. An added challenge for student-athletes is their substantially increased need for foods and fluids, needs that are much greater than the typical college student.²⁻⁴

College athletes often have poor diets that can lead to increased feelings of fatigue⁵ and risk of injury.^{6,7} In addition, they are at particular risk of consuming inadequate energy (too few calories) and insufficient carbohydrate to meet their training needs.^{2-4,8} These young people are often misinformed about nutrition, have little variety in their diets, hold onto rigid, unrealistic beliefs about their diets, and have distorted views of their body image,^{2,3,9} all of which predispose athletes to poor eating behaviors in adulthood and future health issues.^{2,9,10} Fortunately, the right educational interventions can result in significant changes in the diets of college students.¹¹⁻¹⁴

Proper nutrition -- eating the right food at the right time -- is vital to enable student-athletes to train, compete, recover, heal, and learn.^{3,15-18} The NCAA is considering changing current regulations that limit how colleges and universities are able to feed student-athletes. These changes would be a major step in the right direction because they would reduce the compliance burden and allow universities the freedom to determine how to meet the daily nutrition needs of their student-athletes.

Proper nutrition for athletes is a 24-7-365 proposition, not something that happens just on training days during a sports season, yet schools are currently allowed to provide only one training-table meal each day, five days each week.¹ **Sports RDs have observed that many student-athletes often eat poorly during the day, consume as much as they can at the training-table, and then over eat during the evening to make up for the large nutrition deficit that develops during the day. Those eating behaviors are not conducive to optimal sports or academic performance.** In addition, some sports health professionals believe that college athletes' interest in risky dietary supplements and performance-enhancing drugs (PEDs) stems in part from the current restrictions on feeding athletes. **Athletes who feel that they are not properly nourished may be more likely to turn to supplements and PEDs.¹⁹**

RESEARCH FACT

Many college athletes have a difficult time meeting current sports nutrition recommendations. A 2013 study assessed the diets of 52 female NCAA Division I athletes (soccer, basketball, cross-country, track and field) to determine how the diets compared to current recommendations from sports nutrition experts. Anthropometric measures (height, weight, body composition), 24-hour recalls, and 3-day diet records were completed on each athlete. The athlete's daily energy intake (calories) was estimated to be significantly below requirements. In addition, 74% of the athletes did not meet the minimum recommendations for carbohydrate intake and 50% missed the mark for protein intake. There were no differences among the sports.

Shriver LH, Betts NM, Wollenberg G. Dietary intakes and eating habits of college athletes: are female college athletes following the current sports nutrition standards? J Amer College Health 2013;61(1):10-16.

RESEARCH FACT

Not surprisingly, students with greater knowledge of nutrition make better food choices. A 2007 cross-sectional study examined the relationship between self-reported eating behavior and nutrition knowledge in 193 first-year college students. Knowledge and behavior was assessed via an online survey. Students with more knowledge of nutrition ate significantly more fruit, protein, and dairy compared with those who had poor knowledge of nutrition. Increased nutrition knowledge was also associated with higher intake of whole grains.

Kolodinsky J, Harvey-Berino JR, Berlin L, Johnson RK, Reynolds TW. Knowledge of current dietary guidelines and food choice by college students: better eaters have higher knowledge of dietary guidance. J Amer Dietetic Assoc. 2007;107(8):1409-1413.

MILK

For most student-athletes, college is their first experience living on their own with the responsibility for feeding themselves. College students are often overwhelmed by the wide variety of choices they have to make once away from home, have few shopping or cooking skills, and little knowledge of proper nutrition.² **The training-table meal is a great opportunity for student-athletes to learn about nutrition and develop healthy eating behaviors that can last a lifetime.** But with most student athletes only receiving one training-table meal per day, it is difficult to sustain optimal eating behaviors.^{20,21}

While the typical college student might require 1,500-3,000 calories each day to meet their energy needs, some athletes have energy requirements that exceed 4,000-5,000 calories each day.^{3,4,16} Student-athletes also have a much larger need for fluid consumption to replace the sweat lost during training. The daily fluid needs for a typical college student might be 2 ½ to 4 quarts (water, milk, juices, etc.) but many athletes require twice that volume or more just to remain normally hydrated.^{3,22}

On top of their elevated needs for foods and fluids, most student-athletes are still growing during their college years. **The continued growth and development of muscles, bones, and brains is strongly influenced by nutrition²² and not surprisingly, so is cognitive performance.**^{18,24,25}

Universities are currently restricted from giving athletes foods as basic as milk at times and locations other than the training-table. Milk turns out to be a great example of a food that provides numerous benefits to athletes yet cannot be freely distributed to student-athletes. Milk is a very affordable source of high-quality proteins and other nutrients that help rebuild muscles, reduce muscle breakdown, refuel muscles, and rehydrate the body, not to mention milk's other health benefits. Even lactose-intolerant athletes can consume lactose-free milk and other dairy products.

Milk and other food proteins are not only vital nutrients for healthy athletes, they are particularly important whenever athletes suffer an injury. Injured athletes often lose their appetites or purposefully eat less, resulting in reduced energy and protein intake.²⁶⁻²⁸ To complicate matters, injuries that result in the immobilization of an arm or leg cause a decrease in muscle protein synthesis (anabolic resistance), the main reason why immobilized muscles atrophy over time.^{26,27} Repair processes begin immediately after an injury occurs and although full repair may take months, poor nutrition can aggravate the initial inflammatory response and slow the healing process.²⁶⁻²⁸

The scientific evidence that has accumulated since the passage of the original NCAA regulations makes it clear that allowing colleges and universities the freedom to feed their student-athletes in whatever way the institutions deem appropriate is in the best interests of the athletes' health, wellbeing, and athletic and academic performance.

RESEARCH FACT

Skipping breakfast and eating meals at irregular times were the primary factors associated with feelings of fatigue in medical school students. A 2008 cross-sectional study in 127 Japanese medical students evaluated a variety of lifestyle factors (sleep habits, diet, BMI, smoking, alcohol intake, exercise) and correlated those factors with feelings of fatigue and academic performance. 16.5% of students were fatigued and reported lower scores for school attendance and pleasure in learning. Also, the fatigued students had a more difficult time understanding of lectures compared to non-fatigued students.

Tanaka M, Mizuno K, Fukuda S, Shighara Y, Watanabe Y. Relationships between dietary habits and the prevalence of fatigue in medical students. Nutrition. 2008;24(10):985-989.

RESEARCH FACT

Athletes are often misinformed about nutrition, consume diets of limited variety, and unnecessarily restrict their dietary intakes. Each of these factors can lead to under-fueled athletes who are preoccupied with thoughts of food, perform poorly, and are at increased risk of injury. These were among the conclusions from a two-year retrospective study of NCAA Division I athletes at a major university. Athletes with poor diets or disordered eating behaviors are at risk of compromised immunity, bone loss, musculoskeletal injury, delayed healing, menstrual dysfunction, cognitive deficits, and poor performance.

Quatromoni PA. Clinical observations from nutrition services in college athletics. J Amer Dietetic Assoc. 2008;108(4):689-694.

RESEARCH FACT

Nutrition is important for optimal healing. Injuries often result in an immobilized limb, a reduction in physical activity, and loss of muscle mass, strength, and function. Proper nutrition can minimize the negative consequences of injury and help speed the recovery process. Consuming inadequate energy and protein prolongs the inflammatory response and slows healing. Injury causes an increase in muscle protein breakdown and a proper diet can help minimize the loss of muscle tissue and speed the restoration of muscle proteins.

Tipton KD. Nutrition for acute exercise-induced injuries. Ann Nutr Metab. 2010;57 Suppl 2:43-53.

EXPERT INSIGHTS

“It’s common for coaches to advise athletes to lose weight to help improve performance, but the athletes receive little guidance as to how to go about losing weight effectively. As a result, they often follow diets recommended by family, friends, and teammates or find a diet on the internet. More often than not, this results in dysfunctional behaviors and ultimately decreases their energy levels and increases their body fat. This can all be prevented with the right counseling and nutrition. Several football linemen I’ve worked with have been able to change their body composition while maintaining their body weight. In other words, they lost fat and gained muscle, and that made them faster, more powerful athletes. Positive outcomes like these provide great learning opportunities for athletes and coaches who as a result have gained a better understanding of how important it is to evaluate body composition and design nutrition plans that support performance over weight loss.”

*Victoria Rosenfeld, RD, CSSD,
Princeton University, Princeton, NJ*

“Sports RDs are trained to identify and solve unique challenges when it comes to nutrition and hydration. For example, we’ve all had college athletes in our offices who are disoriented because they simply haven’t eaten frequently enough to maintain their blood sugar levels. This happens because college athletes have less structure in their dietary habits and often don’t have the shopping or cooking skills to create wholesome meals. International athletes are particularly vulnerable because their family support is so distant and their food preferences differ from what is available to them. And of course a lot of athletes restrict their intake in misguided attempts to achieve unrealistic weight or body-image goals. The current NCAA guidelines make it difficult for sports RDs to help athletes overcome these challenges.”

*Dave Ellis, RD, CSCS, Sports Alliance, Inc.,
Colorado Springs, CO*

“In our work with professional athletes and the military, we set up a recovery station right off the training floor. We have found that making nutrition and hydration convenient improves post-activity nutrition. By putting the right foods and beverages in front of them at the right time, we remove barriers to great fueling strategies and that leads to better recovery and adaptation.”

*Amanda Carlson-Phillips, MS, RD, CSSD,
Athletes’ Performance, Phoenix, AZ*

“Many athletes want to lose weight to meet preconceived notions of how they think their bodies should look, but end up with poorer performance, illness or injury because they followed a friend’s suggestions or internet advice about weight loss. To avoid those problems when working with athletes, we focus on nutritional ways to improve their fitness, strength, and performance, with the overall goal of increasing lean body mass and reducing fat mass, rather than weight loss. I often adjust the nutrient ratios of their diets to ensure they consume adequate high-quality proteins in foods such as yogurt, milk, cheese, and nuts, not only at meals but also as snacks during the day. This approach is especially important for female athletes as restricting their calorie intake impairs performance, dramatically increases their risk of stress fractures, anemia, menstrual problems, and encourages disordered eating habits. It’s great to see the smiles on their faces when they realize that they’ve lost fat weight and improved performance without a restricting their diet or focusing their emotional attention on a single number on a scale.”

*Kayla Matrunick, MS, RD, CSSD, LDN,
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