

Caring for Your Body as an athlete in the green industry

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As a production arborist or member of the green industry, would you consider yourself an athlete? According to Merriam-Webster, an athlete is “a person who is proficient in sports and other forms of physical exercise.” Therefore, all production workers in the green industry should consider themselves athletes. In fact, an industrial athlete has been described as a worker in industry whose job is in the format of physical training. Production workers in the tree care industry *must* be proficient in physical exercise in order to keep up with the demands of the job. In order

to function like an athlete, you must care for your body like one, which includes an understanding of how the body functions during physical activity. This article will discuss how your body functions and what it needs to maintain peak performance when working as an industrial athlete.

How do muscles get energy?

In order for a muscle to contract, it must have fuel or an energy supply. The body stores carbohydrates we consume as glycogen. During physical activity, this glycogen is broken



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down into glucose, which is used as energy for muscle activity.

Fats and carbohydrates can be used for prolonged, low-intensity activity lasting up to 90 minutes. When glycogen stores become depleted, the athlete runs out of energy or “hits the wall.” This can become a concern for production arborists who typically work for greater than 90 minutes without a break. A short break involving a snack containing carbohydrates and healthy, unsaturated fats will provide a boost of energy. Some athletes may “carbohydrate load” the day prior to prolonged activity to replenish and maximize glycogen stores. Performance athletes and industrial athletes should avoid no- or low-carbohydrate diets because of the needed energy that carbohydrates provide.

Nutrition Needs

The body requires carbohydrates and fats as primary energy sources for activity and physical performance. Carbohydrates are stored in the form of glycogen. Once glycogen stores are full, the body begins storing fat. Protein is used for the repair and building of muscle and body tissues. Excess protein will also be stored as fat. Key amino acids found in protein are needed to build and repair muscle tissue.

Many industrial athletes do not eat enough; they skimp on breakfast and often delay lunch. If an athlete does not consume enough carbohydrates for energy, then the body will break down fat. If fat is not available, the body will use a back-up system to breakdown consumed protein and muscle into glucose, causing muscle wasting and preventing the necessary repair of tissues. Athletes do not have much fat to burn for energy; therefore, they must make sure they are eating enough to have energy to function without causing muscle breakdown. Burning protein as fuel is not efficient and causes water loss, which increases the risk of dehydration and will lead to poor performance. Many injuries in the green industry occur just before lunch, which is likely associated with low blood sugar due to depleted energy stores and dehydration. It is important to take a mid-morning break for a snack and to hydrate; this will boost blood sugar levels for improved energy, resulting in increased productivity.

In the green industry, industrial athletes often skip lunch because of the sluggishness they experience after eating, making it difficult to get going again. This occurs when the meal does not have a good balance of carbohydrates, fats, and proteins. When lunch is heavy in carbohydrates, it will result in increased insulin levels, which will cause sleepiness and decreased mental focus. To avoid this, eat a balanced lunch with a combination of carbohydrates, fats, and proteins, and avoid simple carbohydrates (e.g., sweets). Choose complex carbohydrates with higher amounts of fiber in combination with protein and unsaturated fats.

Table 1. Estimated daily caloric and hydration needs for an arborist.

	Sedentary	Groundworker	Climber	Hydration Needs
Male; 33-years-old 160 lb (72.57 kg) 5'10" (178 cm)	2,469 kcal	4,804 kcal	5,093 kcal	80 oz (2.37 L) + 48 oz (1.42 L) = 128 oz (3.79 L)
Female; 33-years-old 125 lb (56.70 kg) 5'6" (168 cm)	1,874 kcal	3,757 kcal	3,983 kcal	63 oz (1.86 L) + 48 oz (1.42 L) = 111 oz (3.28 L)

Note: The above values are averages based on age and BMI. The values were calculated with Nutrition Data (<http://nutritiondata.self.com>). Values were calculated using the following activity averages: Climber: 1 hour ascent, 1 hour descent, 2 hours work positioning; Groundworker: 2 hours lifting, 2 hours dragging brush to chipper.

In the arborist’s trade, it is important to consume enough calories to provide the necessary energy to safely perform your job day after day. The increased caloric needs for a groundworker and climber are listed in Table 1. Keep in mind: it is not just about calorie consumption. It is important to obtain necessary nutrients for body function from food intake, so eat a diet rich in a variety of whole foods.

How does the body cool itself during activity?

The breakdown of glycogen required for muscle activity releases heat that builds up and raises the core body temperature. The body must rid itself of this heat and maintain



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a core temperature within a few degrees of the well-known 98.6°F (37°C); therefore, active people need reliable cooling mechanisms. Our body has three primary means to cool itself: 1) increased blood flow, 2) heavier breathing, and 3) sweating.

Blood carries heat to the capillaries near the skin's surface, removing heat from the core; this is effective only when air temperatures are below 95°F (35°C). Another cooling mechanism involves breathing heavier to get more oxygen, which expels heat during exhalation. However, the most important part of the cooling system, accounting for 75% of all cooling is the body's ability to produce and excrete sweat. This cooling occurs from the evaporation of sweat. Sweat must evaporate for effective cooling; therefore high humidity will slow the body's ability to cool because the evaporation rate is slowed. The sweat will accumulate on the skin and soak clothes, but will not provide effective cooling because it cannot evaporate. Working on days that are both hot and humid can be dangerous, as the body can lose up to 102 oz (3 L) of sweat in an hour, but can only absorb about 34 oz (1 L) from fluid consumption, which will lead to dehydration. Heat exhaustion and heat stroke may result from insufficient cooling of the body and dehydration.

Hydration Needs

Water is necessary for survival. It is a key nutrient that is essential for a variety of body functions. Proper hydration is essential to everyone, but athletes have an even greater need. Water has a profound effect on brain function and energy levels; even slight dehydration impairs coordination, concentration, and thinking, and will decrease performance. To determine an estimate of the amount of water the body needs, simply divide your body weight by two and this is an approximation of the number of ounces/liters needed per day. For example, an adult weighing 160 pounds (72.57 kg) will require 80 oz (2.37 L). Twelve additional ounces (0.35 L) are needed for every hour an athlete is physically active, causing elevation of core body temperature. Therefore, if a person (160 pounds) is active for four hours of the workday,

an additional 48 oz (1.42 L) of water is needed for a daily intake total of 128 oz (3.79 L). A sports drink can be helpful in replacing electrolytes and providing carbohydrates, which will boost blood sugar to increase energy for those that are very active and sweat a lot. However, it is important to avoid excess consumption of sports drinks when not active due to the excess sugar. Keep in mind the body can lose up to 102 oz of water per hour in the worst of conditions, but can only absorb 34 oz from fluid consumption, therefore hydration should begin the day before activity. Also, proper hydration in the colder weather is easily forgotten, but just as important.

Excess caffeine and alcohol consumption will contribute to dehydration. Caffeine intake exceeding 250 milligrams, the equivalent of 8–16 oz (0.24–0.47 L) of coffee, 16–64 oz (0.47–1.89 L) of soda, or a single energy drink can be dehydrating. Alcohol consumption results in dehydration, which is a common contributing factor to hangovers. Alcohol and excessive caffeine (above 250 mg) inhibits the action of antidiuretic hormone, which causes the kidneys to start increasing the release of water from the body in the form of increased urination. The fluid loss resulting from excess caffeine or alcohol intake must be replaced to prevent dehydration.

Athletic teams have a water cooler on the sidelines to keep the athletes hydrated. This should be essential for industrial athletic job sites. Providing water to workers can be one of the most important investments an employer makes to the performance and productivity of employees.

Rest and Recovery

Rest from intense physical activity is important for muscle recovery and injury prevention. Most industrial athletes not only work hard, but play hard as well. Even professional athletes in sports have a day of rest each week during the season and a greater amount of rest during the offseason. Downtime allows for refueling of energy stores through proper nutrition. Carbohydrates are needed to replenish glycogen stores and protein is needed for muscle and tissue repair. Industrial athletes need to take at least one day of rest each week from being physically active to allow for needed muscle recovery and repair.

Sleep

Sleep is the time for the body to repair itself. Muscle tissue is rebuilt and restored during sleep. Sleep deprivation causes physical and mental decline, and coordination and agility suffer. Athletes perform better with adequate sleep. The amount of sleep a person needs will vary from individual to individual, but healthy adults need between 7.5 and 8 hours of sleep per night. A sleep-deprived individual is more likely to make cognitive and physical errors. Effects of chronic sleep deprivation include: reduced problem solving skills, difficulty concentrating, impaired motor skills, decreased judgment, decreased coordination, and poor reaction times, all of which increase the risk of an accident.



Begin hydrating the day prior to activity to ensure adequate hydration.

The next time you step on a job site, remember that you are an industrial athlete, and therefore need to care for your body as one. Your body is a moneymaker. In the same way an athlete in professional sports must keep their body in optimal shape in order to negotiate a top salary, properly caring for your body as an athlete will not



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only make you more productive and profitable, but also help to prevent a career-ending injury.

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