



## What is Training Day and Why is it Part of the TD1 Program? Dr. Chad, PhD

### **Background/Introduction**

Training Day is a line of nutritional supplements formulated to meet the specific needs of athletes. The Training Day line contains a product called Game Time that is intended to be taken prior to exercise and throughout exercise. The Training Day line also provides a protein-based supplement (Post Fuel) which is intended to be taken after a workout. As outlined and discussed elsewhere on the website, the decision to use these nutritional supplements is personal and should be made in conjunction with support from parents, coaches and even a dietitian with knowledge of sports nutrition. Evidence does exist that athletes can get all of the nutrients their bodies need by following a well-constructed diet, but when put into the practical sense of a busy schedule and sometimes extremely high caloric needs, the practicality and benefits of nutritional supplements like Game Time and Post Fuel should remain as a consideration. In this respect, it's important to remember that nutritional supplements are best used in conjunction with a healthy, balanced diet and a challenging exercise program. They are not intended to regularly take the place of regular meals or snacks.

### **The Anatomy of Training Day**

Game Time contains a mixture of vitamins, minerals, carbohydrates, protein, amino acids and other nutrients that help fuel the body during exercise. Below is a brief description and scientific summary of the key ingredients found within Game Time.

*Whey Protein Concentrate:* Whey protein is the most popular form of supplemental protein and it comes from milk. Milk contains two predominant types of protein: whey and casein. Whey protein has been researched to a great extent and is widely accepted for its ability to support the dietary needs of exercising athletes. Research has indicated that ingestion of whey protein can improve the building of proteins found in muscle to a greater extent both at rest and when taken after resistance exercise (Tang 2009). In addition, when used over the course of several weeks of resistance training, whey protein has consistently been shown to help increase strength and muscle mass more than when nothing is consumed or when just carbohydrates are consumed (Cribb 2006; Cribb 2007). Components of whey protein can help strengthen the immune system and may also help with weight control (Campbell 2007).

*Cordyceps Sinensis:* Cordyceps has been used in Chinese cultures for centuries as a remedy for various health ailments including increased energy, immune function and endurance performance. A number of studies are available in humans which have provided Cordyceps for 2 – 12 weeks and demonstrated improvements in endurance exercise performance (Nagata 2002; Yi 2004; Nagata 2006; Chen 2010). Other studies in sedentary adults showed improvements in work output and aerobic fitness while a 6 weeks study in competitive athletes increased fitness capacity (Xio 1999; Talbott 2002), and improved metabolic responses to stressful exercise (Nicodemus 1996).

*Arginine AKG 2:1:* Arginine is a nonessential amino acid, which means the body can produce this amino acid in sufficient amounts. Arginine stimulates immune function and promotes secretion of several hormones. As a nutritional aid, arginine is suggested to help improve aspects of performance and body composition while resistance training. The research support for these

changes is somewhat conflicting with one study showing a slight improvement in strength performance after eight weeks of resistance training (Campbell 2006), which was also supported by the work of Elam and colleagues (Elam 1989). Other studies using resistance exercise (Walberg-Rankin 1994) and aerobic style exercise (Sunderland 2011) suggest minimal to no impact for arginine use.

*Creatine Monohydrate:* Creatine is an amino acid that is produced inside the human body and is also found in meats in high concentrations (Buford 2007). When used as a nutritional aid, creatine helps to increase the body's ability to reproduce energy through increases in phosphocreatine stores inside the muscle. Supplementation with creatine typically results in around a 40% increase in muscle creatine levels and research has shown it to improve single-rep and multiple-rep exercise performance, maximal strength and recovery from various types of stressful exercise (Kreider 2003; Buford 2007). Creatine use while resistance training has also indicated greater improvement in lean tissue and body composition. Hundreds of studies have been published involving creatine monohydrate with a majority of them showing various types of improvements in exercise performance (Kreider 2003) with no known side effects, with the exception of weight gain (considered a side effect for weight-conscious athletes) (Greenwood 2003; Kreider 2003).

*Citrulline AKG 2:1:* Citrulline is a nonessential amino acid that interacts closely with arginine. It is involved with a key metabolic pathway that results in energy production inside the body and has also been suggested to help with the clearance of lactate, a compound produced in the body during intense exercise. Clearance of lactate is associated with improved chemistry inside the cells which may go on to help with performance. Only study is available which has explored citrulline for its ability to influence energy production, but the type of exercise lacked practicality, thus limiting the conclusions which can be drawn (Bendahan 2002).

*Siberian Ginseng 0.8%:* Ginseng is a popular herb known for its use in many functions. Like Rhodiola, a wide variety of nutrient content is known to exist many scientific outcomes for this herb varied as well. Many different types of Ginseng exist with Asian and American Ginseng having the greatest of literature to support its use. A comprehensive review of Asian Ginseng indicated it possess ergogenic effects in a majority of the available literature (Bucci 2004) and other forms of Ginseng commonly exert outcomes which impact blood glucose changes (Sievenpiper 2004).

*L-Taurine:* Taurine is an amino acid found in abundant amounts in the muscle, heart and brain. Taurine is linked to a number of functions in the body namely cell function, calcium metabolism, detoxification and nerve function. Studies using laboratory animals have consistently reported favorable outcomes including increases in performance (Matsuzaki 2002; Yatabe 2003) and improved responses to injuries (Dawson 2002). In young adults, one week of taurine improved maximal work and time to exhaustion time while running (Zhang 2004). Finally, taurine may help with body temperature control (Bouchama 1993) and control over oxidative stress inside the body (Zhang 2004).

*L-Isoleucine, Leucine, L-Valine:* Collectively referred to as the branched-chain amino acids. All three of these amino acids are considered essential to the diet which means the body cannot produce them and they must be acquired in the diet. Previous research has clearly shown that the essential amino acids are critically necessary for stimulation of muscle protein growth (Tipton 1999; Borsheim 2002). Additional research has suggested that much of the impact for the essential amino acids may come from the branched-chain amino acids and in particular leucine (Garlick 2005). These amino acids have also been suggested to improve exercise performance, reduce mental fatigue, and reduce muscle breakdown. The majority of supportive research for these amino acids

in a performance scenario involves prolonged endurance exercise. The branched-chain amino acids are preferentially broken down during exercise when fuel supplies are running low and in this respect, people have shown their supplementation to help reduce muscle breakdown (Williams 1999).

*Rhodiola 3%:* An herb which is classified as an adaptogen. Its suggested uses included a host of functions. A well-controlled study by De Bock had 24 active, healthy men and women perform a series of tests after one dose and again after four weeks of rhodiola use (REF 353). Improvements in an endurance test were noted after the first dose as well as increases in peak oxygen consumption and carbon dioxide production, both measures of aerobic capacity. These changes were not evident after four weeks. Other studies have offered mixed results and many have suggested the source of Rhodiola can impact its efficacy (REF 357).

*Sodium Chloride:* Better known as salt in our diet, sodium chloride is commonly found in many foods. Both sodium and chloride are required to maintain extracellular volume and plasma osmolality. It is recommended that healthy adults should consume 1.5 grams of sodium and 2.3 grams of chloride (3.8 grams total) each day to replace the amount of salt which is lost in the sweat. The process of sweating is central to our bodies ability to regulate its own temperature and replacement of fluids and sweat when exercising, particularly in hot and humid environments is very important. Many sports drinks and related products have included sodium chloride to help replace those amounts which are lost but also to ensure adequate levels of both are sustained during exercise to allow for effective regulation of body temperature.

*Caffeine:* Caffeine is one of the most widely used stimulants in the world and occurs naturally in a number of foods and beverages. The growth of the “energy drink” category and unrivaled popularity with coffee in adolescent individuals has resulted in a steady increase in their caffeine intake. The average caffeine intake is 200 mg as it is added to many cold medicines, pain medications as well as some weight loss products. A good number of studies have indicated caffeine results in improvements in various aspects of performance, particularly those with some type of endurance component (Ivy 1979; Graham 1991). In addition, a number of recent studies have indicated that caffeine may also favorably impact various types of resistance exercise (Astorino 2010; Astorino 2011; Duncan 2011).

*Vitamin B6:* This vitamin is one member of the B-vitamin complex and is involved in many cellular processes. These processes include gluconeogenesis (a process inside our body that produces glucose), niacin formation, metabolism of fats, formation of red blood cells and some hormone actions. Previous studies have suggested that exercise increases the loss of this vitamin (Manore 2000) and because of its role in various metabolic processes, this vitamin is often included in various forms of nutritional supplementation.

*Vitamin B12:* Vitamin B12 is also called cyanocobalamin and it refers to a group of cobalt-containing compounds. This vitamin works as part of carbohydrate and fat metabolism and also plays a role in building proteins found in our cells. Unless a previous deficit in this vitamin is present, available research indicates additional amounts afford no additional effects (positive or negative).

## **Scientific Support for Training Day**

Recent research has been published using Game Time providing scientific support that it can be used safely and it can positively impact performance. In this research, ten college-aged (both men and women) participants performed two identical exercise testing sessions. Each testing session was separated by at least a week and 30 minutes prior to each testing session a single serving of either Game Time or a placebo was ingested. The placebo was predominantly carbohydrate and provided the same amount of energy as what is contained in Game Time. The participants completed runs to exhaustion at intensities ranging between 90% and 110%. Two measures of performance were recorded and when Game Time was ingested running capacity was improved by 11% and times to reach exhaustion were improved by 10 – 12% (Fukuda 2010).

A second report was also published using different data from this study and this report looked at the impact of combining Game Time on a daily basis with three weeks of high-intensity exercise training (Smith 2010). In this report, critical velocity (a measure of performance) significantly increased in the Game Time group while no change was noted for the placebo group. Similarly, anaerobic running capacity increased in a statistically similar fashion for both groups and training volume increases in Game Time were significantly greater than the changes seen in the placebo group. Finally, improvements in body composition were also noted where percent body fat significantly decreased and lean mass significantly increased in those individuals who consumed Game Time. Improvements were made in the placebo group as well, but they were significantly different than the changes seen with the placebo group.

### **How To Use It Best**

Nutritional supplements like Game Time are intended to be used in conjunction with a regular strength and conditioning program and a sound, balanced diet. It is best suited to be consumed as a pre-workout or pre-competition snack and should be taken somewhere between 30 and 60 minutes before the session begins, depending on what your digestive system prefers. Game Time is not intended to take the place of other healthy foods and meals which should already be a part of your daily diet. Participants in the TD1 are not required to use Training Day, but it's been included because it's been shown through well-controlled university research to be an effective addition to a healthy diet and intense exercise program. Those athletes who are considering its use should do so after talking with their parents and a dietitian with knowledge of sports nutrition.

### **Summary/Conclusions**

In summary, Training Day products are included in the TD1 program because it has been validated by university research to be a safe and effective nutritional supplement for exercising athletes. It's important for young athletes to understand that Game Time is intended to work with or in addition to a healthy diet and challenging workout program. Therefore, athletes who choose to supplement their diet should pay close attention to the quality of their diet and realize that to get the greatest experience from the TD1 program they must also work hard to improve their diet and challenge themselves each day with their workouts.

NOTE: To view the published scientific abstract of the research completed on Game Time, please click on the links below.

[Game Time Study #1](#)

[Game Time Study #2](#)

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