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SOCCER FIT-FACTS

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CAFFEINE USE FOR PERFORMANCE ENHANCEMENT IN SOCCER

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 Soccer Fitness Training Centre Summer Hours / CONCACAF 2012 Women's U17 Championship Thousands of dietary supplements exist for 'over-the-counter' purchase today, many of which propose benefits to performance for athletes. Coaches, parents, as well as athletes themselves, seem to be bombarded today by advertising companies selling products which they claim will reduce injuries, enhance recovery, and will make players perform at a higher level. Parents of young athletes should be especially wary of dietary supplements that they may be giving to their children. Among the many risks of taking dietary supplements are:

- possible absence of any active ingredient
 - possible presence of an illegal / banned substance
- possible impurity / presence of contaminants in the product / packaging
- lack of long-term study / lack of knowledge of possible side-effects

To recognize supplements that are potentially effective and relevant to soccer, three specific criteria must be met:

1. Does the supplement work? (it must affect some physical, physiological, psychological, or other health factor that has an influence on performance in soccer)

2. Is the supplement safe? (it must not cause any adverse health effects)

3. Is the supplement banned? (it must not contain any substance which is named in a banned substance list, or which may result in a positive doping test)

The purpose of this article is to focus on and explain the use and benefits of a commonly-used die-

tary supplement which has been scientifically proven to achieve some sort of performance enhancing effect in athletic populations: Caffeine.

Does it Work?

Caffeine is a stimulant, popular both among athletes and the general population, and contained in coffee, tea, chocolate, as well as several different kinds of soft drinks and colas. In a thorough review of scientific literature about caffeine, Hespel et. Al. (2006) concluded that caffeine most likely benefits performance by deceasing the perception of fatigue, enhancing central drive, and/or improving muscle fibre recruitment. Studies on caffeine in endurance athletes (cyclists) showed that both moderate caffeine doses (between 5 and 13 mg per kg of body weight -Graham & Spriet, 1991, Pasman et.Al., 1995) and lower doses (between 2-6 mg per kg of body weight - Graham & Spriet, 1995, Kovacs et.Al., 1998) caused a substantial improvement in endurance exercise capacity. More recently, a study by Cox et. Al. (2008) showed that doses as low as 90mg of caffeine during a 2 hour exercise test could result in significant performance improvements as compared to subsequent tests.

While research into the effects of caffeine on soccer players is minimal, the evidence shown above should be directly applicable to the sport of soccer, which, like endurance sports such as cycling, also places a heavy demand on the aerobic system in order to supply energy for muscular work. Caffeine is especially useful for soccer players both because it is rapidly absorbed (peak plasma levels are typically reached within 1 hour of ingestion) and because the performance enhancing effect on endurance (through reduced perception of fatigue, enhanced central drive, and

increased muscle fibre recruitment) is maintained for at least 3 hours after ingestion (Graham et. Al., 1998). These means that caffeine could be ingested during the pre-game warm-up, and still have a positive performance enhancing effect even if the game goes into extra time (total of 2-2.5 hours of physical activity).

Is it safe?

Habitual caffeine users, including athletes, will commonly consume doses of caffeine similar to the ones listed in the studies above on a daily basis, and such doses have never been shown to cause any adverse or negative health effects. Thus, low doses of caffeine can be considered safe for athletes.

Is it banned?

It must be noted that caffeine is presently listed as a banned substance by the International Olympic Committee (IOC), and the NCAA / CIS (American and Canadian University athletics associations) but not the World Anti-Doping Agency (WADA). The quantity at which caffeine is considered banned, however, is 15 mcg (micrograms) per mL (milliliters) in a urine sample. In layman's terms, this concentration would be the equivalent of a dose of 8 or more mg per kg of body weight (or the equivalent of 10-15 cups of coffee). This means that the "low" doses used in the studies mentioned in this article (which clearly have a positive effect on endurance performance, and ranging from between 1-6 mg per kg of body weight) would not be considered banned by any sport or athletic association, and will not lead to a positive drug test. SF

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GUIDELINES FOR CAFFEINE USE IN Soccer at different levels of play

TYPE OF USER	DOSE 2-4 WEEKS PRIOR TO COMPETITION	DOSE 30-60 MINUTES PRIOR TO COMPETITION	
NON-HABITUAL USER (0-4 CUPS OF COFFEE/TEA PER WEEK)	1 cup coffee/tea every other day (3-4 cups per week)	Minimum of 75mg, maximum of 4mg per kg of body weight	
HABITUAL USER (7-14 CUPS OF COFFEE/TEA PER WEEK)	1 cup coffee/tea per day 7-5 days prior; no coffee/tea 4-1 days prior	2-6 mg per kg of body weight	



GUIDELINES FOR CREATINE Supplementation in soccer

PHASE	DOSE	TIME DURATION	
LOADING	20 GRAMS/DAY	5-7 DAYS	
MAINTENANCE	5-8 GRAMS PER DAY	2 WEEKS – 3 MONTHS	

GUIDELINES FOR ELECTROYLTE Replenishment in soccer

AGE CATEGORY	TEMPERATURE 0- 15 ° C	TEMPERATURE 15- 25 ° C	TEMPERATURE > 25 ° C
YOUTH PLAYERS (U8-U14)	250-300mg	350-500mg	750-2000mg
TEEN / ADULT PLAYERS	300-500mg	500-2000mg	2500-5000mg







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CREATINE SUPPLEMENTATION IN SOCCER

In the previous article, the point was made that, in order to recognize supplements that are potentially effective and relevant to soccer, three specific criteria must be met:

1. Does the supplement work? (it must affect some physical, physiological, psychological, or other health factor that has an influence on performance in soccer)

2. Is the supplement safe? (it must not cause any adverse health effects)

Is the supplement banned? (it must not contain any substance which is named in a banned substance list, or which may result in a positive doping test)

Does Creatine Work?

Creatine is a guadinine (amino acid) compound, naturally occurring in meat and fish. Creatine is stored in the body in two forms: free creatine, stored in the blood, accounts for approximately 40% of the total creatine in the body. A modified molecule of creatine, called creatine phosphate, is the body's second source of creatine. and accounts for the remaining 60%. The primary energy source of short-duration, high intensity exercise, creatine phosphate is crucial for the performance of sports that involve these types of movements, including soccer. When such exercises are performed (for example, several short sprints done in a short amount of time) the body's natural supply of creatine phosphate is depleted, which can effect subsequent repeated sprint performance.

The most commonly used dietary supplement is a form of creatine called creatine monohydrate, which is sold in powder form. For athletes, including soccer players, creatine supplements will elicit two different performanceenhancing effects:

1. an increased ability to perform short sprints

2. increase in the gains in muscle size and strength that typically accompany resistance training

For the purpose of this article, I will be focusing on improvement months. number 1, as this has more relevance to soccer players. The increase in ability to perform short sprints occurs as a result of increasing the body's stores of creatine phosphate inside exercising muscles. The more creatine stored in the muscle, the greater the anaerobic capacity or, more specifically, the greater the exercising time to exhaustion during high intensity, short duration running (sprinting). There have been several studies conducted on athletes (including soccer players) which have demonstrated this training effect. Although soccer is an aerobic sport, there are moments during soccer games, called repeated sprint sequences (RSS's), where players will perform several short sprints without a lot of recovery in between. At the elite male professional level, players typically perform between 5 and 10 RSS's per game. Increased free creatine and intramuscular creatine will help soccer players to improve their performances of RSS's. Furthermore, the demand to replenish creatine phosphate in the muscles, in order to allow athletes to continue to run/sprint fast throughout the game, is constant, so having more creatine available will speed up the replenishment of creatine phosphate as it is used, and thus allow players to maintain high intensity running ability longer throughout a game.

Is Creatine Safe?

Typically, the dose of creatine administered is approximately 20grams per day, for an initial "loading period" of 5-7 days. After this period, doses will typically be decreased during a "maintenance phase", to between 5-8 grams per day, over the subsequent weeks and/or months.

Because creatine monohydrate supplementation has become widespread in both athletic, as well as general populations, several long-term studies have been done to examine the effects, and potential negative side-effects, of the supplement. To date, there have been no negative side effects reported from creatine supplementation done following the aforementioned guidelines (5-7 day loading phase with 20 grams per day followed by 14-90 days of maintenance with 5-8 grams per day), other than some gastrointestinal distress when more than 10 grams per day are ingested (Ostojic et.Al., 2008). These doses are easily obtainable by ingesting creatine monohydrate in powder form, which is readily available over-the-counter at drug and health food stores. Thus, creatine is both safe, easy to find and use, and effective in improving performance.

Is Creatine Banned?

To date, both the World Anti-Doping Agency (WADA), the International Olympic Committee (IOC), as well as the NCAA and CIS, do not list creatine as a banned substance. Consumption of creatine by athletes, including youth, amateur and professional soccer players, is legal.

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"Having more creatine available will speed up the replenishment of creatine phosphate as it is used, and thus allow players to maintain high intensity running ability longer throughout a game. "









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ELECTROLYTE REPLENISHMENT IN SOCCER

With the start of the summer soccer season, all players and teams across Canada - from amateur youth clubs to senior professionals - will begin training and playing games in the heat. Temperatures in big cities across the nation can be as high as 35 degrees Celsius, with humidity and smog advisories adding to the cumulative risks of the dehydration and heat related illnesses for soccer players. While a lot of research has focused on hydration guidelines and requirements in soccer. somewhat less attention has been paid to electrolyte replacement, which is equally, if not more important to both the prevention of heat illnesses and optimization of performance on the pitch. This article will focus on guidelines and best practices for electrolyte consumption and replenishment for soccer players.

What are Electrolytes?

Electrolytes are molecules of salts (sodium, potassium, calcium, magnesium) which are found within our body's cells (including muscle cells) as well as within intracellular fluid throughout the body. They are called 'electrolytes' because they contain an imbalanced number of electrons, and thus carry an electrical charge (either positive or negative). Athletes, including soccer players, require a precise balance of electrolytes within the intracellular (inside cells) and extracellular (outside cells) environments, in order to regulate hydration, blood pH, as well as nerve and muscle function. Sodium is the main electrolyte contained throughout the extracellular fluid, and is the primary electrolyte responsible for fluid balance in the body.

Why are Electrolytes Important for Soccer Players?

When athletes sweat, both water and electrolytes – the main one being sodium – are lost. The exact amount of water and sodium lost will vary depending on various factors including individual differences, temperature, and exercise intensity. In a recent study by Shirrefs et.Al (2005), found that male professional players averaged a loss of 85 mmol of sweat sodium per game, which is equivalent to an average "salt" loss of 5 grams. Other studies examining soccer games during hot temperatures (equal or greater than 30 degrees Celsius) have found that soccer players can lose up to 7 grams of salt during a game. If these salt losses are not replenished, soccer players will experience a variety of performance decrements, including heat cramps, loss of muscular strength and power, decreased recovery between sprints, and lower maximal oxygen consumption (decreased endurance). Severe electrolyte depletion can also lead to a more serious condition called hyponatremia. which in the worst cases can even cause death. Consuming water alone, especially in the heat when sweat rate increases, will not help with electrolyte depletion, and will actually decrease the concentration of electrolytes in the body, which can increase the risk of hyponatremia. Full replenishment of electrolytes during training and games, therefore, should be a primary concern for all soccer players.

The Problem with Sports Drinks

Over the past twenty years, the use of sports drinks containing a mixture of water, sugar, and electrolytes has risen in athletic populations, including soccer players. The two most commonly used sports drinks are Gatorade, and PowerAde. The combination of water, sugar, and electrolytes in Gatorade and PowerAde makes sense, because all three nutrients are essential for optimal athletic performance. The problem with these sports drinks, however, is that they may not contain enough electrolytes – specifically, not enough sodium – to help soccer players when exercising in the heat. The sodium concentration of Gatorade is



450mg per litre, while the sodium concentration of PowerAde is even lower, at only 225mg per litre. Both drinks come in bottles that range from 300mL to 750mL (less than 1 litre). Given the fact that soccer players can lose 5-7 grams (or 5000-7000mg) of sodium during a 90-minute training session or game, neither Gatorade nor PowerAde will even come close to replenishing the electrolytes lost during soccer.

The Solution: Add Salt!

The solution to this problem is to simply add sodium to sports drinks like Gatorade and PowerAde. Salt packets, which are inexpensive and can be purchased at almost all food and drug stores, contain between 250-500mg of sodium. Thus, adding / mixing 1-2 salt packets with Gatorade or PowerAde will bring the total sodium content up to the amount needed to replenish electrolytes lost during sweat, which will prevent hyponatemia and the other performance decrements described above. A good way of determining whether more or less sodium is required is to measure players' body weight before and after training and games. A loss in body weight of more than 1 kilogram typically indicates that some extra sodium supplementation may be required. The chart on page 2 lists some simple guidelines regarding sodium supplementation, at different age categories and temperatures, for soccer players. Always consult a physician before making any changes to your diet, including adding sodium to your diet. SF



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We are on the Web! www.soccerfitness.ca

SOCCER FITNESS INC.

SOCCER FITNESS TRAINNG CENTRE 2ND FLOOR, TRIO SPORTSPLEX 601 CITYVIEW BOULEVARD VAUGHAN, ONTARIO, L4H 0T1 Phone: 647-829-4360 E-mail: richard@soccerfitness.ca Soccer Fitness was created to help coaches at all levels of the game improve their knowledge and practical skills in training their athletes. With huge and growing numbers of players registered in Canada at the youth level, it often seems that there are just too many players and not enough qualified fitness trainers. Today, most clubs in Ontario have Club Head Coaches and Technical Staffs, whose primary responsibility is to help train, educate their club's "rep" or competitive coaches, and ensure that they are able to plan and deliver appropriate technical and tactical training to their respective teams. Physical training of soccer players, however, seems to be the missing link in most clubs' overall training programs. Soccer Fitness is a company that aims to help coaches in understanding and implementing appropriate physical training ing programs for their athletes.

SOCCER FITNESS INC-NEWS FOR JULY/AUGUST 2012

1. SOCCER FITNESS TRAINING CENTRE SUMMER HOURS

Just in time for the summer and end of the school season, the Soccer Fitness Training Centre will be changing our hours of operation. Starting Monday June 25th, 2012, our

new / updated hours will be:

Mondays: 11:00am-1:00pm / Tuesdays: 7:00-9:00pm / Wednesdays: 11:00am-1:00pm, 7:00-9:00pm

Thursdays: 7:00-9:00pm / Fridays: 11:00am-1:00pm, 7:00-9:00pm / Saturdays/Sundays: CLOSED

Training sessions at the Soccer Fitness Training Centre must be booked and confirmed by calling the office at (905) 417-4110.

2. 2012 CONCACAF WOMEN'S U17 CHAMPIONSHIP/ 2012 FIFA WOMEN'S U17 WORLD CUP

Soccer Fitness Inc. has recently returned from the 2012 CONCACAF Women's U17 Championship, held in Guatemala City, Guatemala, May 2-12. Held every 2 years, the tournament comprises the best teams from the CONCACAF (North, Central America and the Caribbean), and doubles as a qualification tournament for the FIFA Women's U17 World Cup, which will be held in Azerbaijan in September, 2012.

Canada placed second in the tournament, losing to the United States 1-0 in the Final on May 12th. They confirmed their place in the World Cup by beating Mexico1-0 in the Semi-Final on May 10th. For more information about the Canadian Women's U17 National Team, and the 2012 FIFA Women's U17 World Cup, visit the following links:



http://canadasoccer.com/

http://www.fifa.com/u17womensworldcup/index.html