

GAME RECOVERY

(Article by Lisa Dorfman, adapted by Ron Fox for TSA)

Refuelling after training is like putting money in the bank--it's the body's safe deposit box for muscle sugars called glycogen. This investment for muscles ensures adequate energy for daily training and overall health. Without food or fluid after exercise, the body is unable to completely recover from workouts and improve performance. The post workout snack, beverage or meal also helps tendons and ligaments to heal, builds and maintains a healthy hormonal & immune system, and keeps electrolytes in balance--minerals that helps muscles to contract and relax on every run and for each hit, kick or tackle.

Recovery Nutrition Science 101 The body continues to burn calories after a workout, called exercise post oxygen consumption (EPOC), which lasts 15 minutes to 48 hours after training. EPOC causes an additional calorie burn and higher metabolism beyond the workout--a benefit for weight and fat management--a drawback when calories are needed for building the performance athlete. The amount of EPOC calories burned depends on gender, training status, training intensity and duration, and fitness level-- accounting for a few to several hundred calories. Why are extra calories burned? EPOC calories are burned because:

- The body replenishes sugar in muscles and replaces the simplest energy form called adenosine triphosphate (ATP) at the cellular level;
- Lactate--responsible for post exercise muscle soreness needs removal.
- Normal breathing, heart rate and body temperature needs restoration to pre-exercise levels
- Blood needs re-oxygenation after muscles cease working out.

Recovery Fuel The post workout food formula can consist of fluids or solid food as long as the athlete can stomach it, literally. Since the gut shuts down after exercise, not all foods will work for everyone. Depending on training type and timing of the next workout, the composition and amount can vary while keeping in mind the golden recovery rule; getting something--anything as long as it's within the window of refueling opportunity, about 15 minutes to two hours after training for adequate replenishment. The best foods to eat are those high in carbohydrates. Planning ahead by storing a sports drink, bar, or snack in the gym bag or stopping for a smoothie on the way home is one way to ensure adequate replenishment within the recovery window. Meals/ snacks with 65% carbohydrates or more, about 0.8g to 1 gram/kg bodyweight / hour have been shown to replenish muscle stores best. For the 150 pound athlete (68 kg) (kg=pounds / 2.2), a snack or beverage with about 54 grams -68 grams carbohydrates. It's just as important to refuel after shorter high

intensity workouts as it is for longer workouts. The difference between the recommended foods depends on whether or not it is the last workout of the day. If athletes have a second workout--lower fat, lower fiber and bland foods are best over high fiber, fat and spicy foods to prevent gut distress. For example, the two-a-day athlete would do better with a plain turkey sub with lettuce and tomato after the first workout instead of a Mexican Taco salad with cheese, refried beans, ground beef, guacamole, salsa and the shell.

RECOVERY FUEL CHART		
FOOD	CALORIES	CARBOHYDRATES (grams)
1 oz dry cereal	110	23
1 slice bread	70	12
Breakfast/snack bar SOYJOY	140	17
Plain mini bagels	160	31
Saltine crackers, 4	50	9
Rice, ½ c	110	23
Pasta, 1 c	159	34
Blueberry muffin	130	20
Cookies, fig, 1	53	11
Baked chips, 1small bag	140	24
Pretzels, 1oz	106	21
Orange juice, ½ c	56	13
Banana, 1	105	27
Muscle Milk Bars, collegiate	170	18
Muscle Milk, RTD collegiate	250	28
Cytomax sport drink, 1 scoop	90	22
Cytomax, 1 packet 40 g	140	35
Gummy bears, 10	87	22
Sport gel, 1 pack	110	27
Canned/plastic pack fruit/own juice	60	15
Unsweetened applesauce, ½ c	50	14
Fruit smoothies, small 20oz	375	84

As for hydration, replacing fluids at a rate of 1-1½ times, about 16-24 oz for every pound lost in sweat. Weighing before and after a training session can provide a good guestimate of fluids lost during exercise. Urine color is the simplest and one of the most accurate measures of hydration. If urine is pale yellow, that's good, while dark urine means dehydration. Completely clear urine is a concern since it suggests overhydration (over-consumption of water and potential loss of electrolytes). Recovery fluids should include water, electrolyte rich sport drinks, and recovery fuels with sugar and

protein (depending on the intensity of the workout) to cover all bases and replace all losses. When food doesn't work, a sport shake is an easy, portable way to replace carbohydrates and protein needed for maintaining muscle gains and strength accomplished during workouts.

Supplements for Recovery You'll find lots of products promoted to target recovery nutrition. What works, what doesn't? Most formulas provide too much fuel for most athletes, some with additional substances, which can be illegal to use. Reading the labels is key to meeting your personal needs. Keep in mind, whole foods are always best since nutrients in food work synergistically with recovery compounds such as antioxidants, omega 3s, vitamins and minerals. The bottom line is to get something in the body after workouts and if you can't eat whole foods, look for a shake, bar or sport drink recommended by a reputable trainer. Most important, recovery fuel is a 24/7 job for athletes. Don't wait until after workouts to try and catch up with a good overall diet. Here's a quick summary of the top three of what's hot, what's not, what's promising.

Recovery Supplements		
Supplement	Proposed Recovery Purpose	Valid? Safe?
Caffeine	Increases muscle glycogen after 4 hours of recovery from exhaustive exercise when consumed with carbohydrate; may also reduce pain perception during exercise.	Not for everyone—high doses may cause arrhythmias, nervousness, palpitations. More research needed.
Whey protein isolate	Whey stimulates muscle protein synthesis due to high amounts of branched chain amino acids, especially leucine, and quick absorption; Also enhances glutathione production—one of the body's natural antioxidants, which protects against free radical damage.	Safe and found in milk, sport bars, shakes, yogurt; almost no lactose, also safe for those intolerant.
Antioxidants	Assists with muscle-induced oxidative damage; vitamins A (beta-carotene), C, and E on markers of oxidation appeared favorable with supplementation; more research is needed.	Not necessary unless deficiency exists; found in fruits, veggies and fortified foods; supplementation poses risks for some individuals.
B-Vitamins	Assists with energy use—protein, carbs and fats; in deficiency states may impact mood and energy levels.	When deficient in diet, needs to be replaced. No evidence of faster recovery.

My personal choice is **FRS** before & during the game & **Muscle Milk Light** (chilled) after the game – all the Best for State Cup – **Ron Fox**

RECOVERY – RECOVERY – RECOVERY

Article from Mike Mahler adapted by Ron Fox for TSA staff & players

Serious soccer players put a lot of thought into their training regimens trying to cover all the angles physical, technical and tactical. However, few put equal thought into restoration or workout recovery. This is a huge mistake, as you need to take your restoration program just as seriously as your training program and this starts with actually having a restoration program! Without adequate recovery you won't last long on your training program or, at least, you'll reach a point where you're working harder for less return. Efficiency and progress will go down the drain as your body gets more and more beat up. I am not talking about your immediate game or training session recovery, of jogs to rid you of lactic acid, cold or contrast therapy to ease muscle and joint stress and massage for soft tissue recovery, as well as your nutritional recovery programs. This is about your day to day, week to week and month to month, recovery and restoration.

SLEEP

A well-rounded restoration program is far more than drinking a protein shake after workouts and **the most important part of any restoration program is adequate sleep**. The only time your body makes changes is when you're sleeping. It doesn't change during your workout, or even right after your workout, it changes while you're sleeping. It's during sleep that your body produces the most growth hormone and does its rebuilding, but this process only occurs during **deep sleep**, so tossing and turning for several hours and getting an hour of REM won't cut it. How much quality sleep do you need? While it varies with each individual, how much sleep you need depends on how much stress you carry and how active you are. For example, a professional athlete training several hours per day needs more sleep than someone training 30-45 minutes per day, a few times per week. You'll have to experiment to find what's best for you. For most people, 8 hours of deep sleep is plenty. In fact, more than eight hours can leave you feeling tired and out-of-it upon awaking. But few people have the luxury of getting too much sleep, in fact, most people are sleep deprived and relying on coffee or other stimulants to get through the day. There's no

substitute for quality sleep: no supplement or drug can provide the benefits of sound sleep. Add sleep time to get the most out of your training program. If you have trouble getting high-quality sleep, try taking **300-500 mg of magnesium citrate** an hour before bedtime. Magnesium is a natural **muscle relaxant** and has a **calming effect** on the nervous system. Due to the poor quality of our soil, most everyone in the U.S. is deficient in magnesium. Other supplements, such as GABA and valerian root, may be useful, but start with magnesium. Finally, avoid doing heavy resistance training too close to bedtime, as high intensity training stimulates the CNS, which increases alertness.

MASSAGE

Regular massage is another component of an effective restoration program. Rather than getting a generic deep-tissue or Swedish-style massage, find a therapist who uses a personalized approach and knows what's best for you each session. Save the massage for the end of your training week since you can feel wiped out after a good sports massage. If you work out Monday through Friday, get your massage on Friday and take the weekend off from training. You may want to go light for the first workout or two, coming back and then ramp it up from there. Getting a massage twice a month makes a big difference in your recovery and, more importantly, your general well-being. I also recommend giving yourself a "stick" or "foam roller" massage after each workout or game.

MEDITATION

Another form of restoration I find useful is meditation. Mental stress is draining and meditation is a proactive way to relieve stress and anxiety. Still, as beneficial as meditation is, most people find it difficult. It's hard to go-go-go all day and then switch into relaxation mode; the mind wanders and even sitting still for as few as twenty minutes while focusing on the breath can be uncomfortable. Fortunately, there's an alternative, which is Holosync. This is a meditation program utilizing sound technology to put you in the same meditative state as experienced meditators. As one moves from the beta brain-wave pattern of normal waking consciousness to the slower brain-wave pattern of alpha, then deeper into theta, and finally to the deepest delta, the fluctuations in the brain are constantly

increasing. These fluctuations give the nervous system input, or stimulus, beyond its ability to handle, the way it is currently structured. In order to handle these fluctuations, the nervous system is forced to reorganize itself at higher, more complex levels of functioning, evolving a new structure that can handle the input it originally couldn't handle. As the brain continues to receive this input, the nervous system will continually reorganize itself, in a series of quantum leaps, some at a micro-level of functioning and some at a much more global level. Holosync is the lazy man's solution to meditation. Start by listening to the program thirty minutes a day for two weeks, then increase to an hour. Listen before sleeping or after training, and you will feel relaxed within a few minutes and often drift into sleep. Don't worry about concentrating on what you're listening to or focusing on a certain way of breathing, just sit, or lie down, relax, and enjoy the program.

INNOVATION

An interesting restoration method is hyperbaric oxygen therapy. A hyperbaric chamber is an inflatable vessel, the size of a coffin, which raises oxygen levels in your body. It creates a pressurized environment forcing the body to absorb more oxygen. My first hyperbaric chamber treatment was a few days before teaching a workshop when I had a chest cold and was feeling considerably less than my best; in fact, I was worried I wouldn't be able to teach the seminar due to impaired breathing. After an hour in the hyperbaric chamber I felt much better, and the next day I was almost back to normal. The following day I was feeling great--just in time for the workshop. If you're claustrophobic, you may find the chamber uncomfortable, but after a session or two you may find the experience relaxing. You can bring your Ipod into the chamber and listen to relaxing music. I listen to a meditation CD and usually fall asleep right in the chamber. I incorporate hyperbaric chamber sessions once or twice per week, depending on how I feel and how hard I'm training.

ACTIVE RECOVERY

Next on the list of restoration programs is the one thing training addicts hate to think about, taking a week off from normal training. Instead having a week of light alternative activities, such as tennis, table tennis, golf,

basketball, volleyball, or other light intensity sports or games. Sometimes the best thing you can do, to get back on the road to training progress, is to not train at all. All players need a break at some point. When you're getting weaker each workout and workouts that used to feel easy, or not too hard, suddenly leave you feeling wiped out, it's time to take a break. Every form of work needs a vacation and yes, serious training is work. it's stress on the body and mind and you can take only so much stress before needing a recharge. Most players come back stronger after a week off, depending on how deeply you've over-trained, even longer time-off periods. Time off re-sensitizes the body to training and sometimes, it's the only thing that works. Also, taking a few weeks off might be the only way to get your enthusiasm back, you'll miss training and want to get back into it ASAP. The point of the week or more off is to give your body a mental and physical break from your regimen.

Regeneration & Reaction for Soccer Players

- ☆ **Low temperatures have positive influence for body circulation and metabolic tolerance during physical loading.**
- ☆ **Cryo procedures also delay of fatigue during muscle activity, especially at athletes in endurance sports. Recommend that application of cold temperatures should be immediately after finishing sport training (so called icing) and should not be too long – maximum 10 minutes.**
- ☆ **Quick reaction time significantly influences performance in some sports. The ability to start and perform short time activity for certain signal of co-player, opponent. Use of mirror drills, call reaction sprint, agilty drills.**
- ☆ **Reaction has to be done in the best moment and by speed which is adequate for the role. Reaction ability in soccer represents not only body motion response but also lower and upper extremities responses. Use of arms in sprinting, agility changing direction, faking on tricks etc.**
- ☆ **Reaction speed includes: perception + anticipation + decision making speed + actual movement speed. This is a bio-motor skill & can be trained.**
- ☆ **Reaction time represents psycho-motor reactivity that central part is genetically determined, meanwhile its peripheral, biomotor part is influenced by training. As shorter reaction time, as better creativity of central nervous system.**
- ☆ **Soccer mainly requires complex speed (speed of the whole motion) not only its elementary forms. Based on many researches, monitoring of reactions and speed abilities are recommended in soccer games.**
- ☆ **Use: agility tests: mirrors, Z balls, tennis balls, mini-tramp skills, jumping skills, color cone sprints, change of directions.**