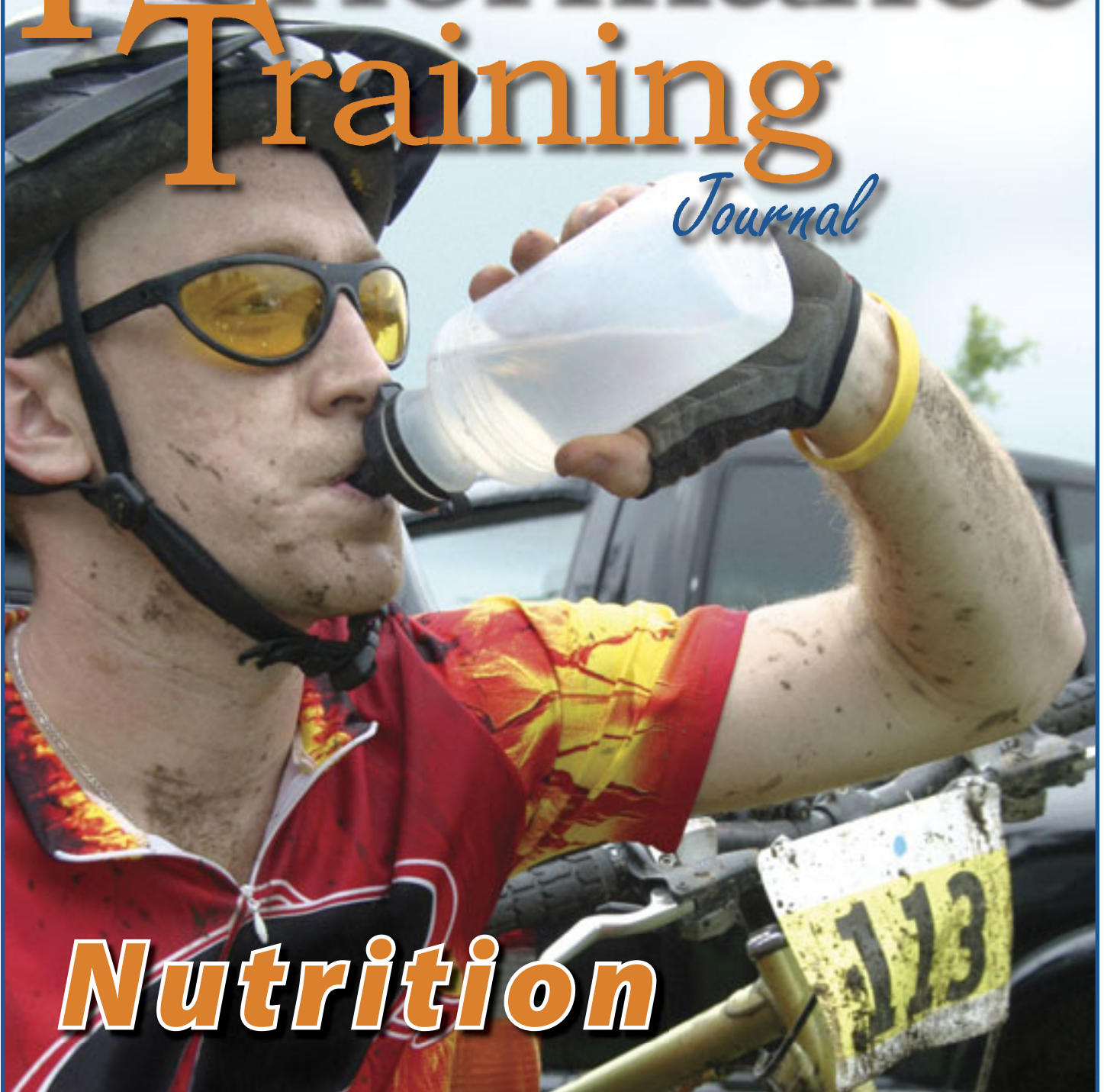


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NSCA's
**Performance
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Journal



Nutrition



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Does it matter if you get your protein from soy or beef?

Recently, researchers from Kansas State University and the University of Arkansas investigated the effects of protein type on resistance training performance and lipoproteins. Twenty one men with a mean age of 65 ± 5 years participated as subjects in this investigation. All subject were initially placed in a two week baseline diet which required them to eat 0.6 g of protein/kg per day from a soy based texturized vegetable protein food. After the initial two week diet period 11 men continued eating the soy based diet, while 10 men consumed 0.6 g of protein/kg per day from beef. All subjects performed resistance training three days per week over the course of the 12 week dietary intervention. After the completion of the study there were no significant differences between the two diets in the overall muscular strength and power of the subjects. The beef group did experience significant increases in total cholesterol, low density lipoproteins (LDL) and high density lipoproteins (HDL), while the group that consumed the soy products did not experiences any significant alterations. Additionally, the beef group had significantly higher cholesterol than the soy group. Based upon this study it appears that the type of protein consumed does not significantly impact the strength gains noted from a resistance training regime in older adults. Conversely, it appears that older adults with a diet which gets the majority of its dietary protein from beef results in significant elevations in cholesterol and low density lipoproteins, which both have been indicated to be risk factors for cardiovascular disease.

Haub MD, Wells AM, and Campbell WW. (2005). Beef and soy-based food supplements differentially affect serum lipoprotein-lipid profiles because of



changes in carbohydrate intake and novel nutrient intake ratios in older men who resistance-train. *Metabolism Clinical and Experimental*, 54:769-744.

Are amino acids better than eating a meal?

Recently, researchers from the University of Texas examined the effects of ingesting a carbohydrate (30 g) and amino acid supplement (15 g of essential amino acids) (CAA) or a meal on protein synthesis. Thirteen men aged 28 to 48 years of age were randomly divided in two tow treatment groups: 1) CAA = 36 ± 10 yrs and 2) Control = 38 ± 8 yr. The CAA and meal were designed to be similar in amino acid content and were administered periodically throughout an 18 hour period. Throughout the day blood and muscle tissue samples were collected in order to assess anabolism. The inclusion of a CAA supplement into a normal diet resulted in a greater anabolic stimulus than the meal treatment as indicated by the $\sim 25\%$ increase in protein synthe-

sis rate. Additionally, the consumption of only meals throughout the 16 hour study period resulted in a negative net protein balance, while adding frequent CAA supplements resulted in a positive balance. The researchers suggested that the CAA supplement was more effective in maximizing protein synthesis rates as a result of the speed with which the supplement is digested and taken up into the system. Based upon these findings it may be recommended that athletes consume some sort of CAA supplement throughout the day in order to maximize the muscular adaptations to their training regimes and maintain a positive protein balance.

Paddon-Jones D, Sheffield-Moore M, Aarsland A, Wolfe RR, Ferrando AA. (2005). Exogenous amino acids stimulate human muscle anabolism without interfering with the response to mixed meal ingestion. *American Journal of Endocrinology and Metabolism*, 288: E761-E767.

Bovine colostrum does not impact strength performance or net protein balance.

Twelve healthy physically active men participated in a recent study to determine the effects of two weeks of bovine colostrums (the nutrient-rich, pre-milk fluid that is secreted by female mammals to nourish their young) supplementation on muscle proteins, serum amino acids, and strength performance. Twelve male subjects with a mean age of 27±5 yrs participated in this study. The study was performed in a double blind placebo controlled method with subjects either receiving 20 mg of a placebo or bovine colostrum consumed in four equal dosages spaced throughout the day. The bovine colostrum contained 62 mg of free amino acids of which 25 mg were essential. Over the course of the two week study, subjects were required to eat from their standard diet and maintain their current level of exercise. When comparing the weeks of bovine colostrums supplementation and placebo supplementation, there were no differences in the caloric intake and carbohydrate, fat, or protein content of the subject's diets. Results indicated that the addition of bovine colostrum did not result in an increase in training volume or markers of muscular strength. The inclusion of bovine colostrum in the diet did result in greater levels of circulating amino acids in the blood. However, no difference was noted in the net protein balance of the bovine colostrums group, even though protein synthesis and breakdown were increased when compared to the placebo group. Based upon these results the authors concluded

that the addition of bovine colostrum had no effect on strength performance or net protein balance in young men.

Mero A, Nykänen T, Keinänen O, Knuutinen J, Lahti K, Alen M, Rasi S, Leppäluoto J. (2005). Protein metabolism and strength performance after bovine colostrum supplementation. *Amino Acids*, 28:327-335.

Does your post exercise supplement really require protein or is carbohydrate enough?

Many sport scientists recommend a post exercise supplementation regime. However, what should that supplement contain? Recently, researchers from Maastricht University and the University of Birmingham examined the effects of carbohydrate (CHO), carbohydrate + protein (CHO+Pro) and carbohydrate + protein + leucine (CHO+Pro+Leu) on post exercise protein synthesis with eight untrained men (22.3±0.9 yr). After the completion of a 45 minute resistance training bout, eight men consumed one of the three supplement drinks. Insulin levels increased in response to all three treatments (CHO < CHO+Pro < CHO+Pro+Leu). The CHO+Pro+Leu supplement resulted in the highest protein synthesis rate and whole body protein balance during a six hour post exercise period. The results of this study suggest that a combination of carbohydrate, protein, and leucine maximize post-resistance training protein synthesis rates in college aged men. While not investigated in the present study the supplement stimulated increases in protein synthesis could ultimately either

improve athletic performance or result in magnified hypertrophy.

Koopman R, Wagenmakers AJM, Manders RJF, Zorenc AHG, Senden JMG, Gorselink M, Keizer HA, van Loon LJC. (2005). Combined protein and free leucine with carbohydrate increases postexercise muscle protein synthesis in vivo in male subjects. *American Journal of Endocrinology and Metabolism*, 288: E645-653, 2005.

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Nutrition

Alcohol Consumption and Its Effects On Performance

Dawn Weatherwax, ATC, RD/LD, CSCS

Nutrition and hydration are two of the keys to optimal performance. Alcohol is a poor nutrient source for a pre-game meal or for hydration. Alcohol is known to slow down one's ability to react to an opponent or object 72 hours following alcohol intake (2). Precision, equilibrium, hand-eye coordination, judgment, ability to process information, focus, stamina, strength, power, and speed are all negatively effected for many hours after blood alcohol levels return to 0.0% (1).

Proper hydration before, during, and after practice/event along with all-day hydration is critical to preventing injuries, creating an optimal environment for building muscle, losing body fat, maximizing energy levels, transporting and absorbing nutrients, and ridding the body of toxins and by-products (2). If an athlete is thirsty, they may have already lost 1- 2% of body weight through dehydration (4). Performance can be decreased up to 10-20% at this

level. Alcohol can cause the body to lose 3% more body fluid in a 4-hour period, leading to dehydration even quicker (5).

In the field of performance, recovery from exercise is dependant on replacing the carbohydrates used up during activity (glycogen synthesis). Consuming at least 30-60g of carbohydrates with 6-10g of protein has been proven to help replace needed carbohydrates and aid in recovery (9). The faster the body recovers, the easier it is to perform at the same optimal levels on a day-to-day basis. Drinking alcohol after exercise for glycogen recovery is unclear, but alcohol may displace carbohydrate intake from optimal recovery—in laymen terms, alcohol calories *MAY* replace the carbohydrate calories usually eaten after exercise leading to improper recovery (3).

Athletes train long hours to perform well. Injuries are repercussions an athlete could incur during practice or competition. Alcohol can cause increased swell-



ing after a game if an injury is sustained because alcohol causes the blood vessels to dilate. Alcohol can also mask pain. For those who are familiar with injuries, the more swelling in an injured area, the longer it could take to recover and get back to optimal playing form. In addition, if the athlete is already taking anti-inflammatory medications or pain relievers, drinking alcohol can increase the risks of stomach irritation and internal bleeding.

Having a certain body fat to muscle mass ratio is related to athletic performance. Research has shown that increased muscle mass increases strength, power, and agility (6,7). However alcohol (ethanol) is one of the worst nutrients you can consume to improve body fat to muscle mass ratio. The carbohydrates found in alcoholic beverages are not converted into glucose and are used to make fatty acids that are stored as fat mainly in the liver. Alcohol has also been shown to increase fat composition. The body prefers to use alcohol as a fuel source when consumed. If you eat high-fat foods when you consume alcohol the fat from these foods are stored as fat. Alcohol also stimulates the appetite and encourages extra intake of calories the body does not need (8).

Table 1. Suggestions to minimize effects of alcohol on performance

1. Avoid excessive drinking.
2. Agree to a limit before drinking.
3. Avoid drinking games.
4. Don't drink alcohol on an empty stomach.
5. Choose low alcoholic beverages.
6. For every serving of alcohol, drink 8-12oz of water, juice, or non-alcoholic beverage.
7. Continue to drink non-alcoholic beverages well after consuming alcohol. ~ 24-72oz of water if hydrated between each drink.
8. Avoid social drinking at least 72 hours before a practice/event.
9. After practice/event re-hydrate properly before consuming any alcohol. For every one pound lost consume 20-24oz of fluids with 300-400mg sodium (i.e. V8 Juice & water, 2oz pretzels with water, Gatorade).
10. Before drinking any alcohol after a workout/event, consume at least 6-10g protein and 30-60g of carbohydrates (Yogurt & fruit, bagel with 2 T natural peanut butter) within the first 30 minutes followed by a well balanced meal in the next 1 ½ hours.
11. Avoid drinking alcohol at least 24-36 hours after experiencing extreme soreness/aches/pains, noticeable bruising or injury.
12. Do not drink alcohol while taking anti-inflammatory drugs. This includes Tylenol and ibuprofen.
13. Keep bi-monthly records of body fat to muscle mass ratios
14. As part of the sports physical ask questions about alcohol abuse. Athletic Trainers, Strength Trainers, Coaches, Physicians and Athletic Administrators can all address this issue. (Please do not exclude high school athletes).

Conclusion

Alcohol and performance do not mix. Alcohol inhibits every aspect of athletic performance. The best choice an athlete can do is avoid alcohol altogether; however, just saying “no” is not a viable option when the majority of athletes want to say “yes”. Table 1 lists some suggestions to minimize the effects of alcohol on performance.

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Upper Body Ergometry: The Most Underused Aerobic Exercise

Joseph M. Warpeha, MA, CSCS, NSCA-CPT

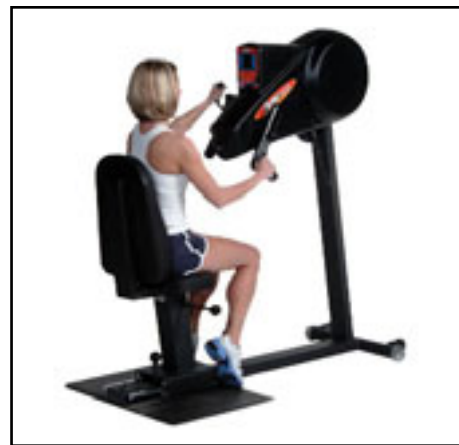
Aerobic exercise usually involves activities that incorporate large muscle groups, are cyclic and rhythmic in nature, and last longer than a few minutes in duration. Naturally, the pieces of equipment that come to most people's minds when thinking about an aerobic workout are treadmills, stationary bikes, elliptical machines, etc. The common denominator of these types of aerobic exercise is significant lower body involvement. This should not be a surprise to anyone since our legs are designed for exactly the purpose of moving heavy loads (i.e. our own weight) for prolonged periods. For many people, however, exercise involving the lower extremities is problematic due to injury of the knees, feet, ankles, or hips. The solution for these people as well as those injury-free individuals who are looking for some variety in their training is the most underused aerobic exercise: upper body ergometry or arm crank ergometry.

Arm cycling involves sitting upright in a seat and "pedaling" with the arms. Upper body ergometry involves nearly every upper body muscle group with particular emphasis on the arms and shoulders. Of course, this mode of exer-

cise requires access to an upper body ergometer (UBE) which many health and fitness facilities do not currently have (see figure 1). Historically, upper body ergometry has been almost exclusively used by paraplegics since they could remove the seat from the machine and perform the arm cranking from their wheelchair.

Figure 1. Upper Body Ergometer (UBE)

Photo courtesy of Hoggan Health Industries



Oftentimes, the only people who regularly use an UBE are paraplegics and triathletes. Obviously, triathletes understand the importance of aerobically training the upper extremities for the swim portion of the triathlon. Why shouldn't everybody incorporate some

degree of upper body aerobic exercise into their routine? It is true that an elliptical machine involves the upper body. However, the handles will move even if your hands are not on them, meaning the legs are actually performing a significant amount of the work. A rowing machine has a significant upper body component, but may not be possible for those with lower body limitations.

The proper body position for the UBE is to first set the seat height so that your shoulders are at the same level as the axis of rotation of the crank. Second, the seat should be moved horizontally so that when your arms are furthest from your body in the cranking cycle, the arms are not quite fully extended (maybe a 5-10° bend at the elbow). The most comfortable hand position typically is a neutral grip (palms facing). The initial intensity and duration will be significantly less than what you would do on a stationary bike or elliptical machine. Perhaps 50 watts for 10 minutes would be a good starting goal. Most will find even this is quite difficult. This is to be expected since the upper body musculature is so much smaller, weaker, and less efficient (mechanically) compared to the lower body¹. However, if you train the upper body aerobically, you will improve with time just as you would with any other progressive overload routine with resistance or aerobic exercise.

For those who train based on heart rate (HR), you will find that initially you will not be able to get your heart rate into your normal target range. The main limitation will be muscular fatigue at first, but this will improve with time. Many will argue that it is impossible to

Table 1. Case study of a 29 year-old male: intensity and heart rate values achieved during various aerobic exercise modalities after 17 months of training (April 2004 – August 2005).

Mode/Exercise	Frequency (per week)	Intensity/Workload (30-min average)	30-min HR Average [†] (beats per minute)	Peak HR [†] (beats per minute)
Outdoor Running (4.1 miles)	2	8.7 mph	186	196
Upright Bike	1	250 watts	185	198
Recumbent Bike	1	250 watts	185	200
UBE	1	160 watts	184	198

[†] Average and peak HR values obtained from a heart rate monitor

get HR values using an UBE anywhere near the same levels as those achieved with lower body modalities.

Table 1 illustrates an ongoing case study examining the differences in performance and physiological variables among four different aerobic exercise modalities. It is the author's contention that you can get a quality aerobic workout on an UBE if you push yourself and are patient for a couple of months while your upper body adapts (when the case study first started 17 months ago, the 30-minute HR average on the UBE was only 144 bpm). Also, your torso and midsection will get a good workout due to the large amount of stabilization required.

So, if you have injuries that preclude you from doing lower body activities or you are looking to add variety to your routine, you may just want to challenge yourself a little and try the UBE. Or maybe you just want a muscle- and joint-specific warm up modality to use for 5 minutes at a low intensity prior to an upper body resistance training session. Either way, you will never know if you don't give it a go.

Medical Note: Upper body aerobic exercise has been shown to cause significantly greater increases in exercise blood pressure than lower body aerobic exercise (1). People with known or suspected cardiovascular disease (hypertension, etc.) should seek the advice of a licensed physician before beginning any program involving upper body aerobic exercise.

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About the Author

Joe Warpeha is an exercise physiologist and strength coach and is currently working on his PhD in exercise physiology at the University of Minnesota-Minneapolis. His current research focuses on bone and tendon adaptations to training and the effects of skeletal loading on their physiological and mechanical properties. Joe teaches several courses at UM including "advanced weight training and conditioning" and "measurement, evaluation, and research in kinesiology". He has a master's

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Nutrition

The Importance of All Meals

Lara Engler

We've all heard the importance of providing our bodies with proper nutrients in order to take on the tasks of the day. Despite this knowledge, skipping meals for dieting reasons or lack of time is commonly practiced (6). These practices have undesirable health consequences and do not always result in weight loss.

How Your Body Reacts to Skipping Meals

Any time you skip a meal, your body goes into "fasting mode". During this fasting, carbohydrates, proteins, and fats are all used for energy. Carbohydrates are the number one source of fuel, followed by protein and then fat. As the fasting continues, the following steps will occur:

- The glycogen storage deposits found in the liver and muscle become depleted.
- As the glucose levels drop, the body looks for other sources of fuel. Since the brain and nerves prefer energy from glucose, protein tissues (muscle and liver) are broken down.

- In efforts to preserve the remaining protein, the body starts to metabolize fat for energy in the form of ketone bodies (acetoacetic acid).

The process of using ketone bodies as fuel is called ketosis. This process can cause the following negative effects on the body (4,9,10):

- Nausea
- Fatigue
- Constipation
- Lowered blood pressure
- Elevated uric acid (kidney disease)
- Stale taste in mouth
- Fetal harm/stillbirth in pregnant women

As the body switches to the use of ketone bodies, it begins to reduce energy output in an effort to protect both fat and lean tissue. In addition, as the lean tissues begin to shrink, they become weaker and perform less metabolic work, reducing energy expenditure even more (4,6,10). Hormones also slow down the metabolism to conserve lean body tissue (10).

This is also known as "starvation mode". This mechanism is thought to have evolved as a defense against starvation (5). The body uses its calories efficiently in order to protect its fat stores, using lean tissue and muscle instead (10). A lowered metabolic rate is a direct result of muscle loss. Accordingly, fewer calories are needed and weight loss slows down (3,7,8).

Undesirable Health Issues

Skipping meals and restricting calories will create cravings. Rapid high blood sugar occurs when you give into these cravings. As a result, your body creates a high amount of triglycerides, which convert to fat-storage. In addition, the depleted glycogen causes low energy levels because blood sugar is not being replaced. Unfortunately, the weight that is lost is mostly water (glycogen is made up of mostly water) and muscle (6).

The slowed metabolism will also have a tough time digesting your food, if you cram in all your meals at one time. This is also commonly seen in people who skip meals. They get so hungry they eat more than one meal worth at one sitting. The already slowed metabolism is going to take a lot longer to work the oversized meal throughout your body. Once again, resulting in weight gain.

Lastly, the success rate of losing weight from skipping meals is relatively poor. A significant amount of weight may be lost at first, but once again this is water and muscle weight, and the chances of gain-

ing the weight back, plus more is quite good (1,3,8). The effects of skipping meals are listed in table 1.

Summary

Dietary restriction by skipping meals should be avoided. The insufficient energy imbalance has undesirable effects, such as increased fat storage and weakened performance. The depressed metabolism will conserve its energy, making dieting less effective and more difficult (2). Using this method in hopes to lose weight may become frustrating and result in even more unhealthy ways of dieting (7).

It has been proven that consuming sufficient calories is better than not getting enough. In addition, getting them on time, thus preventing energy deficit state during the day, is better than getting them late (3). Combining exercise and healthier eating (reducing fat in diet, etc.) is highly suggested (1). Be sure to eat all meals throughout the day. They do not have to be huge meals, but enough to get your metabolism going,

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Table 1. Effects of Skipping Meals (2,3,6,8,10)

• Decreased energy expenditure
• Decreased metabolic rate
• Weight gain
• Increased preference of fat in the diet
• Decrease strength
• Increased injury rates
• Decreased bone density
• Decreased body temperature
• Decreased performance
• Decreased resistance to disease
• Renal regulation and Electrolyte imbalance
• Impaired Thermal regulation
• Decreased Testosterone level
• Mood swings
• Menstrual dysfunction

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Choices

Suzie Tuffey Riewald, PhD, NSCA-CPT,*D

Life is filled with choices, and the choices we make have a significant influence on subsequent behavior. Are you aware of all the choices you have related to exercise and sport performance? Think for a minute about the numerous choices you make. On a daily basis, you have a choice about whether or not to exercise. You have a choice regarding how you talk to yourself, you have a choice about what and how much to eat and drink, you have a choice about what to focus on during a workout or competition, etc. Throughout the day you have endless choices.

Now, for a more difficult question – what are you doing with all these choices? More importantly, do you make a choice after consideration? Often, athletes just act or think a certain way without really making a conscious decision to do so. This may happen because it has become habitual – such as automatically grabbing for an apple instead of potato chips or telling yourself you are a horrible golfer after missing putts. Or, it could be because we do not realize it is something we have a choice about — “I had no confidence” “I couldn’t get into practice today” — are examples of statements that connote a choice being out of one’s control. In reality, an athlete may struggle getting motivated for practice but actually has the choice about whether to wallow in that low motivation or take

purposeful steps to increase motivation. Think about how much more productive practices could be, how you could enhance performance and achieve your goals by being more aware of and purposeful about choices that influence your performance.

The following are three steps that should serve to increase your awareness of the choices you have and how you can be more purposeful in how you act and think; to make choices based on consideration rather than by habit or ignorance.

1. Be clear regarding what you are trying to accomplish as it relates to sport and exercise. That is, identify your goal. Your goal could be to run a specific time, to lose weight, to lift a given number of kilograms, etc.
2. Become aware of the numerous choices you make that tie into the pursuit of your goals. We can fool ourselves into believing that “it is the way it is” rather than believing that we have created things as they are through the choices we make. Take the example above about the athlete who “couldn’t get into practice today”. Such lack of motivation is not out of one’s control. In truth, she allowed herself to be ambivalent about practice. She had the choice to implement strategies to enhance motivation and energy, but did not.

3. Make purposeful choices, after consideration, that can lead to achievement of your goal. Now that you are aware of all the choices you really have, ask yourself, “Am I making the right choices? Are my choices helping me reach my goal or holding me back?” Commit to making better choices. Commit to putting forth the effort to break habits and to take control of your thoughts and behaviors.

Follow these steps and take control of your performance by purposefully considering all the choices you make. Think about why you do the things you do. Know that the choices you make, conscious or not, directly impact your practice and competition. Make the right choices and watch your performance improve.

About the Author

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Tips to Avoid Exertional Heat Illness

Jason Brumitt, MSPT, SCS, ATC, CSCS

Each year the media reports at least one tragic story of an athlete who dies from a heat related illness. The sad case is that most of these deaths may have been avoidable if either prevention strategies were implemented or immediate medical attention was available. Medical professionals are unable to attend all practices or games, so it is important for coaches and athletes to implement strategies to prevent heat related illness as well as recognize common signs that a heat related illness is occurring.

This article will provide you with information on how to reduce the risk of developing a heat related illness. Common signs of heat related illnesses are also presented. A thorough explanation of how to treat a heat related illness falls outside the scope of this article.

Heat related illnesses occur as a result of exercising in high temperatures, exercising while dehydrated or with an electrolyte imbalance, or a combination of the two (4). During exercise, it is normal for one's core body temperature to increase.

If the body does a poor job of dissipating heat though, a heat related illness will develop.

Recognition of Heat Illness

Exertional heat illnesses range in intensity from heat cramps to the severe critical condition of heat stroke. The onset of heat illness necessitates immediately

stopping exercise and seeking first aid treatment. Table 1 presents common signs and symptoms of a few heat related illnesses (1).

Tips to Reduce Your Risk of Heat Illness

By adopting the following recommendations, you will reduce your risk of experiencing a heat related illness.

Keep Hydrated

Many athletes begin practice or an exercise session already dehydrated. Proper hydration at all times is necessary for maintaining vital physiological functions. The National Athletic Trainers' Association (NATA) recommends that athletes should consume 17 to 20 ounces of water or a sports drink 2 to 3 hours prior to exercise and drink another 7 to 10 ounces 10 to 20 minutes before starting exercise to ensure proper hydration (2). It is also recommended that one

Table 1. Common Signs and Symptoms of Heat Related Illness (2)

Heat Cramps	
Dehydration	Thirst
Sweating	Fatigue
Muscle Cramps	
Heat Exhaustion	
Elevated core body temperature	Dehydration
Dizziness	Lightheadedness
Headache	Nausea
Cool, clammy skin	Sweating
Heat Stroke	
High body core temperature	Dizziness
Drowsiness	Confusion
Irritability	Hot and wet or dry skin
Vomiting	Tachycardia
Possible loss of consciousness	

drink 7 to 10 ounces of water or sports drink every 10 to 20 minutes during exercise. After exercising, rehydrate by drinking 20 to 24 ounces of a sports drink or water per pound of weight loss (it is necessary to record your pre exercise weight) (2).

Monitoring Weather Conditions

Exercising in hot and humid conditions increases the chance of an individual developing a heat related illness. The use of a sling psychrometer is employed to measure both dry and wet bulb temperatures (4). These readings combined with humidity are used to determine the safety of practicing in hot, humid conditions. If your facility does not have the means to measure the heat stress index, use caution practicing or exercising in a hot and humid environment. You should choose to exercise early in the morning or in the evening when temperatures are cooler.

Acclimatization

Even top athletes who are unaccustomed to hot, humid conditions are at risk for exertional heat illnesses. One must become acclimatized gradually to the heat. Slowly increase your intensity of exercise and duration of exposure to the heat. Usually a period of 7 to 14 days is necessary for full acclimatization (4,1,3).

Medications

The use of certain medications can increase the risk of developing a heat related illness. Review with your primary care provider how the side effects of any of your medications will affect your ability to exercise in hot, humid conditions. Even some over the counter

medications and supplements (including caffeine and ephedra) may also increase fluid loss (4).

Appropriate Clothing

Wearing excessive clothing will affect one's ability to dissipate heat. Wearing dark colored clothing will absorb heat from the environment (1). It is best to wear lightweight, light colored clothing (4). If you sweat a lot, during breaks change out of the wet clothing into dry clothing (4).

Conclusion

To learn more about heat related illnesses, log on to www.nata.org. Go to the "Public Information" section and click on "NATA statements".

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Conditioning Games

Tracy Morgan Handzel, CSCS

Conditioning is a necessary component for most sports and one that many athletes do not like. While repetitive sprints, suicides, and other running drills, when utilized properly, help to improve energy system development, they can be boring, tiring, and uninspiring. It is possible however, to reach your conditioning goal by incorporating games into your conditioning routine.

Many games enhance conditioning and improve sport skills by demanding feats of agility, explosion, acceleration, and quick stops with changes in direction along with displays of eye-hand coordination and reaction. All the while making the entire task at hand a bit more enjoyable. Here are a few games to consider as part of your conditioning routine.

Tag

Tag is a great way to increase your ability to move explosively in different directions. “Freeze Tag” demands multi-directional, explosive movements to avoid being touched by the “it” person. “Free” team mates by leaping over them or tagging them. Be sure to mark boundaries at a distance that allows all athletes to move freely but requires

sharp changes in direction when chased. You can determine which energy systems to focus on by making the game longer in time or shorter in time and by changing the number of times the game is played.

Frisbee Football or Ultimate Frisbee

Frisbee football or ultimate Frisbee has the potential to improve eye-hand coordination and movement skills while developing aerobic and anaerobic energy systems. As in soccer or football, the object is to put the Frisbee into the defender’s goal. Quick changes of direction along with explosive accelerations and stops make this game specific to sports like basketball, football, lacrosse, and tennis. It is important to make and adjust rules to fit your training goal and current performance level.

Wall Ball Relays

Wall ball relays allow for the inclusion of upper body explosive actions during conditioning. Using a medicine ball (2-8kgs) throw the ball (overhead or chest pass) towards a wall that is about 25 ft away. Immediately run after the ball and retrieve it as it bounces back off the wall. Return to the starting line



and repeat this three to five times. On your last run, hand the ball off to the next athlete. Once again, adjust the wall distance and repetitions to fit your needs and abilities.

Punt Returns

Punt returns are a great way to improve eye-hand coordination, speed, and anaerobic conditioning. Unlike straight ahead sprints, returning punts forces you to concentrate on catching the ball before exploding forward. Make this more demanding and multi-directional by adding defenders.

Keep Away

Keep away demands that players on one team continuously play catch and keep moving around a predetermined field ensuring that the opposite team does not intercept the ball. Use any kind of ball, determining score by timing a team’s possession or counting catches.

Games have the potential to turn a dreaded conditioning session into a competitive, sport specific, and fun diversion. Alter the components of these games to specifically address the energy demands of your sport. Review the article entitled “Interval Training” in the *NSCA’s Performance Training Journal*

(4.2) to review the basics of energy system development and how to best modify these games to meet your performance needs.

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Which Sports Aids Are Right For You?

Debra Wein, MS, RD, LDN, NSCA-CPT

If you are considering a supplement, it can be very difficult to decide which sports drink, gel, or bar would be best for you. In this, the first of a three part series, we will review sport drinks and what to look for when choosing one.

Sports Drinks

Sports drinks are more appropriate than water when athletes participate in activities that last longer than one hour. These drinks not only replace the water that is lost through sweat, but also the carbohydrates that supplement the body's glycogen stores. In addition, sports drinks help replenish sodium and electrolytes lost during physical activity.

When selecting a sports drink to drink during activity, athletes should look for one that contains a carbohydrate concentration between 4 – 8% (1). This concentration best facilitates gastric emptying and absorption through the intestines. To determine what the concentration is in your favorite drink, divide the number of grams of carbohydrate in an 8 ounce serving by 240 and then multiply by 100 to get the percent.

Keep in mind that more concentrated sports drinks are better used after activity to replenish hydration and nutrient needs.

In addition to hydration and carbohydrates, sports drinks also supply the athlete's body with much needed sodium and potassium. These electrolytes are important because they may promote fluid retention, prevent hyponatremia (low blood sodium), muscle cramps, and may also promote increased taste and thus intake. Look for a drink that has:

- at least 100 mg per 8 ounces of sodium
- 30 mg per 8 ounces of potassium (2).

New to the market are so called “energy drinks”. Many of these contain caffeine and/or carbonation and should be avoided during physical activity. These drinks may cause upset stomach or an increased rate of fluid loss.

To decide what drink would be best for you, look on the nutrition label of your favorite drink. Be sure to try out your

new drink during practice, and not during a game or competition... practice during practice.

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