

NSCA's

Performance Training Journal

Issue 7.5
Sept. / Oct. 2008
www.nsca-lift.org

Sports Nutrition

Features

**Body Composition &
Its Affects on the Sports
Performance Spectrum**
*Dawn Weatherwax-Fall, RD,
CSSD, LD, ATC, LAT, CSCS*

**Do Athletes Maintaining
Healthy, Well-Balanced
Diets Really Need
Nutritional Supplements?**
*Donovan T. Santas, CSCS,*D*

**Ten Simple Things
to Remember for
Optimal Nutrition**
*Amanda Carlson, MS,
RD, CSSD*



NSCA™

Sports Nutrition
special issue

Sponsored by



about this PUBLICATION

NSCA's *Performance Training Journal* is a publication of the National Strength and Conditioning Association (NSCA). Articles can be accessed online at www.nsca-lift.org/perform.

All material in this publication is copyrighted by NSCA. Permission is granted for free redistribution of each issue or article in its entirety. Reprinted articles or articles redistributed online should be accompanied by the following credit line: "This article originally appeared in *NSCA's Performance Training Journal*, a publication of the National Strength and Conditioning Association. For a free subscription to the journal, browse to www.nsca-lift.org/perform." Permission to reprint or redistribute altered or excerpted material will be granted on a case by case basis; all requests must be made in writing to the editorial office.

NSCA Mission

As the worldwide authority on strength and conditioning, we support and disseminate research-based knowledge and its practical application, to improve athletic performance and fitness.

Talk to us...

Share your questions and comments. We want to hear from you. Write to *NSCA's Performance Training Journal* Editor, NSCA, 1885 Bob Johnson Drive, Colorado Springs, CO 80906, or send email to kcinea@nsca-lift.org.

The views stated in the *NSCA's Performance Training Journal* are those of the authors, and do not necessarily reflect the positions of the NSCA.

NSCA's

Performance Training Journal

Editorial Office

1885 Bob Johnson Drive
Colorado Springs, Colorado 80906
Phone: +1 719-632-6722

Editor

Keith Cinea, MA, CSCS,*D,
NSCA-CPT,*D

Assistant Editor

Brian Newman, MS, CSCS

Sponsorship Information

Richard Irwin
email: rirwin@nsca-lift.org

Editorial Review Panel

Scott Cheatham, DPT, OCS, ATC,
CSCS, NSCA-CPT

Jay Dawes, MS, CSCS,
NSCA-CPT,*D

Meredith Hale-Griffin, MS, CSCS

Michael Hartman, MS, CSCS,*D

Mark S. Kovacs, MEd, CSCS

David Pollitt, CSCS,*D

Matthew Rhea, PhD, CSCS

David Sandler, MS, CSCS,*D

Brian K. Schilling, PhD, CSCS

Mark Stephenson, ATC, CSCS,*D

David J. Szymanski, PhD, CSCS,*D

Chad D. Touchberry, MS, CSCS

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

sports nutrition



6 **Body Composition & Its Affects on the Sports Performance Spectrum**

Dawn Weatherwax-Fall, RD, CSSD, LD, ATC, LAT, CSCS

Take a closer look at body composition and its affect on performance. Included are recommended guidelines and a discussion on different methods for predicting body composition.

17 **Ten Simple Things to Remember for Optimal Nutrition**

Amanda Carlson, MS, RD, CSSD

Nutrition does not have to be complicated. These ten simple things can help you start eating better immediately.

10 **Do Athletes Maintaining Healthy, Well-Balanced Diets Really Need Nutritional Supplements?**

Donovan T. Santas, CSCS,*D

This article looks at the need for athletes to appropriately supplement a well-balanced, whole food-based diet for optimal nutrient levels, and discusses the current use of supplements by athletes.

departments

4 **Mind Games Learning from Olympians**

Suzie Tuffey Riewald, PhD, NSCA-CPT

As an athlete, you were undoubtedly one of the 4 billion people that watched the recent Olympic Games in Beijing. This article takes a look at some of the outstanding performances of the '08 Olympics, and how proper mental skills played into the performances.

14 **Training Table Does Your Diet Pass Muster?**

Debra Wein, MS, RD, LDN, CSSD, NSCA-CPT,*D

Take a look at five basic tenets for a good diet, and how you can easily determine your caloric requirements.

8 **Fitness Frontlines**

G. Gregory Haff, PhD, CSCS,*D, FNSCA

The latest news from the field on milk ingestion and endurance performance, β -alanine supplementation and body composition, whey protein supplementation and fat loss, and the effect of vitamin C and E supplementation on high intensity performance.

16 **Ounce Of Prevention Recognizing Disordered Eating Habits in Athletes**

Jason Brumitt, MSPT, SCS, ATC/R, CSCS,*D

The prevalence of disordered eating in female athletes has been estimated to be as high as 62%, whereas 33% of male athletes may demonstrate behaviors associated with disordered eating. The purpose of this article is to present the signs and symptoms associated with disordered eating.

13 **In The Gym Nutritional Quality vs. Nutritional Quantity: Properly Fueling Athletes for Optimal Performance**

Kyle Brown, CSCS

Looking at the label does not always guarantee you are buying a nutritious product. This article discusses how to look beyond the label and find foods that not only are healthy, but can better fuel your performance.

about the
AUTHOR

Suzie Tuffey Riewald received her degrees in Sport Psychology/ Exercise Science from the University of North Carolina —Greensboro. She has worked for USA Swimming as the Sport Psychology and Sport Science Director, and most recently as the Associate Director of Coaching with the USOC where she worked with various sport national governing bodies (NGBs) to develop and enhance coaching education and training. Suzie currently works as a sport psychology consultant to several NGBs.

Learning From Olympians

As an athlete, you were undoubtedly one of the 4 billion people that watched the recent Olympic Games in Beijing. People across the globe tuned in to witness amazing athletic performances from a multitude of sports. While watching these phenomenal athletes perform, we cannot help but be “awed” by the physical and technical prowess of these athletes who are able to do things most of us do not even dream about. What performance stands out in your mind?

- Many will immediately think of Michael Phelps when recalling the 2008 Olympic Games. He won eight gold medals, setting seven world records in the process. The commentators talked often of his physique that is so suited to swimming and his amazing technical skills.
- For some, it may be the marathoners who run sub five minute miles for 26.2 miles.
- Others may remember the gymnasts who have phenomenal body control and awareness. They perform athletic feats that seem beyond the realm of the physically possible, often times seeming to defy gravity.
- All of the sports; shooting, wrestling, badminton, equestrian, soccer, volleyball, fencing, and so on offer examples of phenomenal physical feats.

The physical, physiological, and technical prowess of the Olympians is, in many instances, quite evident. But, what else separates these athletes? Are there other skills or characteristics that they possess? Let me give a few examples and you tell me the skills or characteristics that enable such astounding performances:

Chen Ruolin, a 15-year-old diver competing in her first Olympic Games, stood on the 10-meter platform getting ready for her last dive. She needed 9.5's and 10's to win the gold. In preparation for the dive, her movements indicated she was going through her dive in her head then she walked to the edge of the platform, did not hesitate, and dove. She nailed the dive and won the event, scoring four perfect 10s and three 9.5s, despite the pressure-filled internal and external environment.

Unexpected tragedy struck the US men's volleyball team. The father-in-law of head coach Hugh McCut-

eon was stabbed and killed in a random act of violence while visiting a Beijing landmark just days before the start of the Games. Consequently, the team was without their head coach for several matches and had to deal with the emotional turmoil of losing someone who had been very close to the team. The assistant coaches and athletes had to manage their emotions and maintain focus on the task at hand. The end result, they won gold, beating Brazil in four sets. Additionally, in the process of getting to the gold medal game, the US team had to fight through a number of 5-set matches where in any one of them it would have been very easy just to “throw in the towel.” However, they consistently rose to meet the challenge. Talk about maintaining focus through an emotional roller coaster.

Michael Phelps' drive for 8 gold medal could have ended very early were it not for the performance of his teammates on the 4x100 meter relay. Jason Lezak was the last swimmer on the relay team and entered the water 0.6 seconds behind the world record holder in the 100 meter freestyle, Frenchman Alain Bernard had an insurmountable lead for all intents and purposes. Lezak lost another 0.2 seconds to the French swimmer over the first 50 meters of the race, only to swim nearly a second faster over the final 50 meters—turning in the fastest relay split every recorded (46.07 seconds) while leading the US to victory by 0.08 seconds. How spectacular was this feat and how much did the mental component come into play? In the individual 100 meter freestyle, Lezak won the bronze with a time of 47.67—a full 1.7 seconds slower than his relay performance. While swimmers definitely benefit from the relay start, swimmers typically only swim several tenths of a second faster in the relay compared to the individual event. Clearly something else played into this phenomenal relay performance.

Yes, mental skills certainly seemed to be a factor impacting performance. In their pursuit of excellence, the athletes used mental skills to manage their emotions, to deal with the environment, to maintain an effective focus, to enhance their performance. Do you manage performance expectations? Are you able to deal with distractions? Do you have a strong determination and commitment?

The above are just a few examples to illustrate the psychological aspect of performance. Research can shed further light. Numerous studies have assessed the psychological characteristics of successful versus less successful athletes. A summary of this research (1) suggests that more successful athletes are characterized by higher confidence, greater management of arousal, better concentration and focus, an in-control attitude, positive thoughts and imagery, greater determination and commitment, and the use of mental skills such as goal setting, imagery, coping strategies and mental preparation plans.

Some of these skills were evident, directly or indirectly, in the athletes competing in the Olympic Games. Other skills are more difficult to observe or infer so it would take talking to the athletes to determine what was going on internally.

Enough about other athletes, now it is your turn. As we have discussed, the physical and technical strengths of elite athlete are often obvious. And, as athletes, you work to develop your own physical and technical strengths. At the surface, mental skills of elite athletes may be less apparent but closer “inspection” reveals they exist. Are you also working to develop your mental skills? Are you equipping yourself with the skills to manage the challenges inherent in sport? If not, now is the time to begin. ■

References

1. Williams, JM and Krane, V. Psychological characteristics of peak performance. In: Applied sport psychology: Personal growth to peak performance. J.M. Williams (Ed.), Mountain View, CA: Mayfield.

PERFORM BETTER!

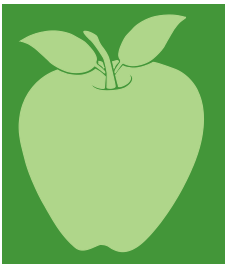
When Speed and Agility Are Important, Turn To The Leaders In Sports Performance.

- *Quality Equipment* • *Expert Staff*
- *Fast Shipping* • *Educational Seminars*

Request Your 2008 PERFORM BETTER Catalog

Call 800-556-7464
www.performbetter.com

PERFORM BETTER!
THE GUIDE TO FUNCTIONAL TRAINING



about the AUTHOR

Dawn Weatherwax-Fall is a Registered/Licensed Dietitian with a specialty in Sports Nutrition and Founder of Sports Nutrition 2Go. She is also a Board Certified Specialist in Sports Dietetics. In addition, she is an Athletic Trainer with a Certification in Strength and Conditioning from The National Strength and Conditioning Association. Therefore, she brings a comprehensive and unique understanding of the athlete's body, and its nutritional needs, to those interested in achieving specific performance goals and optimal health. Weatherwax-Fall is also the author of The Official Snack Guide for Beleaguered Sports Parents and The Complete Idiot's Guide to Sports Nutrition. She is an Official Speaker for the Gatorade Sports Science Institute and on the approval speaker list for the NCAA. She has also been featured on television shows including: Good Morning America, MSNBC, Geraldo Rivera, and Fox News.

Body Composition and Its Affect on the Sports Performance Spectrum

Dawn Weatherwax-Fall, RD, CSSD, LD, ATC, LAT, CSCS

Having a certain body fat to muscle mass ratio is related to athletic performance. Research has shown that correct portion of muscle mass increases strength, power, and agility (8,9). Table 1 (see next page) provides recommend body fat percentages for both men and women.

However, to gain lean muscle it is not just about the exercise protocol but nutritional intake and timing (2,7). Research shows three out of four student athletes may not be getting enough to eat. It also shows that 70% of the women and 73% of the men are not getting enough total calories, only 81% of the women and 90% of the men are consuming enough carbohydrates, and just 68% of the women and 81% of the men are eating enough protein based on USDA guidelines. Intakes of salt, total fat, saturated fat, and cholesterol often exceed recommendations, even in diets deficient in major components (4).

To help you achieve your goals, you should know your body composition. But body composition is much more than a body fat percentage number. Below are different ways the measurement can be utilized.

1. Knowing what percent body fat assists in the type of fuel mixture an athlete needs. If an athlete has a higher body fat they usually need fewer calories and fewer carbohydrates. The opposite is true if the athlete has a low body fat. They usually need more calories and carbohydrates due to more lean weight.
2. In any strength and conditioning or specialized nutrition program there needs to be a way to measure its effectiveness. Body composition testing is an important measurement tool since most athletes want to gain muscle, lose fat, or do both.

3. When you are evaluating body fat percentages the challenge is not to just evaluate the percent body fat number but to also evaluate the lean weight number. Even though you may have the appropriate body fat percentage for your sport, you may still have room for improvement if you continue to gain lean mass.
4. When an athlete has encountered a severe injury where rehabilitation will take several months, measuring body composition on a monthly basis can be a tool to minimize a gain in body fat. Athletes can gain body fat quickly when activity has been limited and eating habits are poor. It is difficult to get an athlete back to "full go" if they have lost muscle and gained body fat.
5. Body Composition testing can be a reassurance test. Many female athletes believe when they gain weight, they are gaining fat. Also an athlete can exchange fat at the same rate they gain muscle so the scale is not displaying the positive exchange.
6. Because female athletes are more vulnerable to developing an eating disorder (5), having biyearly body composition tests can detect any significant changes. These changes could shed light on an unhealthy behavior with food.

The best ways to measure body composition are by hydrostatic weighing, DEXA Scan or Bod Pod testing. However many people do not have access or the funds to use these methods. The next best step is to use Lange skin fold calipers. They are easy to use, easy to learn, and very affordable. However you want to make sure you take the time and follow strict protocols to ensure accuracy (3). Take a minimum of three tests at each site and have at least two numbers that are within a millimeter. If you do not, then keep retesting the site until you do. The last thing you want is the body fat percentage to increase due to poor measuring techniques. Lastly

you want to avoid going the easy route and buy a bioimpedance device. These devices can be anywhere from 6 – 10% off because these techniques depend on the athletes hydration status (6). These tools start off by measuring how fast the current runs through the body. The more hydrated the athlete the lower the body fat will register. The more dehydrated the athlete is the higher the body fat will measure.

Body Composition testing is not just about measuring fat. It can be a very effective tool for menu planning, monitoring progress, improving current athletic status, part of a rehabilitation protocol, offering encouragement, and finding irregularities in behavior. Now that is a tool. ■

References

1. ACSM's *Guidelines for Exercise Testing Prescription*. American College of Sports Medicine, 7th Edition. Philadelphia: Lippincott Williams & Wilkins. (2005).
2. Biolo, G, Williams, BD, Fleming, RY, and Wolfe, RR. Insulin action on muscle protein kinetics and amino acid transport during recovery after resistance exercise. *Diabetes*, 48:949 – 957. (1999).
3. Heyward, VH, Wagner, DR. *Applied Body Composition Assessment*. Champaign, IL: Human Kinetics. (2004).

Classification	Women	Men
Essential	10 – 12%	2 – 4%
Athletes	14 – 20%	6 – 13%
Fitness	21 – 24%	14 – 17%
Acceptable	25 – 31%	18 – 25%
Plus	32% plus	25% plus

Table 1

General Body Fat Percentage Category (1)

4. Hinton, P, Sanford, T, Davidson, MM, Yakushko, O, and Beck, N. Nutrient intake and dietary behaviors of male and female collegiate athletes. *Inter J of Sports Nutrition and Exercise Metabolism*, 14: 389 – 390. (2004).
5. Kirk, G, Singh, K, and Getz H. Risk of Eating Disorders among female college athletes and nonathletes. *Journal of College Counseling*, 4(2): 122 – 132. (2001).
6. McArdle, W, Katch, F, Katch, V. *Exercise Physiology. (4th Edition)*. Philadelphia: Lippincott Williams & Wilkins. (2006).
7. Rasmussen B, Tipton, KD, Miller, SL, Wolf, SE, and Wolfe, RR. An oral essential amino acid-

carbohydrate supplement enhances muscle protein anabolism after resistance exercise. *J. Appl. Physiol*, 88:386 – 392. (2000).

8. Spaniol FJ. Physiological predictors of bat speed and throwing velocity in adolescent baseball players (Abstract). *Journal of Strength and Conditioning Research*, 16(4): 1 – 18. (2002).
9. Spaniol FJ. Predicting throwing velocity in college baseball players (Abstract). *Journal of Strength and Conditioning Research*, 11(4): 286. (1997).

about the
AUTHOR

G. Gregory Haff is an assistant professor in the Division of Exercise Physiology at the Medical School at West Virginia University in Morgantown, WV. He is a member of the National Strength and Conditioning Association's Board of Directors. He is a Fellow of the National Strength and Conditioning Association. Dr. Haff received the National Strength and Conditioning Association's Young Investigator Award in 2001.

G. Gregory Haff, PhD, CSCS,*D, FNCSA

Does Milk Ingestion Improve Endurance Performance?

One of the main effectors on the capacity to perform prolonged exercise is the availability of carbohydrates. Many studies have reported that the ingestion of carbohydrates before and during exercise as an ergogenic tool may improve performance. Many commercially available carbohydrate supplements are formulated in concentrations of 2 – 10%. Interestingly milk has a similar concentration while containing similar electrolyte and macronutrient breakdowns. Recently researchers from Loughborough University in the United Kingdom compared the effects of water, carbohydrate + electrolytes, and milk + carbohydrate on exercise capacity. Eight healthy men were randomly assigned a treatment order with each subject performing endurance trials with four different supplements. Each subject ingested 1.5 mL/kg body mass of plain water, a carbohydrate-electrolyte beverage, and low fat milk (0.1%) + added glucose prior to the exercise bout and every 10 minutes during the bout. The exercise bout consisted of performing cycle ergometry work at 70% of VO_{2peak} until volitional exhaustion. There were no differences in the exercise duration between the four supplements, but the inclusion of milk or carbohydrate appeared to result in longer exercise durations when compared to the water condition. The carbohydrate-electrolyte beverage increased exercise duration by 17.3 minutes, the milk condition increased exercise duration by 10 minutes, and the milk + carbohydrate resulted in 9.5 minutes more exercise when compared to the water condition. There was also no difference in the subjective feelings experienced during the exercise trial between the treatments. Taken collectively the results of this study suggest that the effects of milk supplementation appear to be similar to that of carbohydrate electrolyte beverages.

Lee, JK, Maughan, RJ, Shirreffs, SM, and Watson, P. Effects of milk ingestion on prolonged exercise capacity in young, healthy men. *Nutrition* 24:340 – 347. 2008.

β -Alanine Supplementation does not Improve Performance of Body Composition After 10-weeks of Supplementation and Resistance Training.

Carnosine is a di-peptide which is synthesized in muscle and central nervous system tissue from histidine and β -alanine. β -alanine supplementation and/or resistance training has recently been linked to increases in muscle carnosine concentrations. It has been postulated that increases in carnosine improved buffering capacity which corresponds to improvements in anaerobic and aerobic exercise performance. Very few studies have examined the effects of β -alanine supplementation coupled with resistance training on muscle carnosine concentration and performance. Therefore the aim of the present study was to examine a 10-week resistance training program coupled with the consumption of 6.4 g/day of β -alanine. Twenty six physical education students were randomly divided into a β -alanine and a placebo supplementation group. All subjects resistance trained four days per week for 10 weeks and took 6.4 g β -alanine or placebo per day. Biopsies, performance, and body composition were assessed prior to and after the 10 week intervention. There were no significant increases in whole body strength between the β -alanine (+19.67%) and the placebo treatments (+17.46). Additionally, no differences in isokinetic strength were noted between the β -alanine (+12.1%) and the placebo (+12.6%). When body composition and body mass were examined there were no differences between the two treatments. The β -alanine supplemented group did express higher muscle carnosine concentrations after the 10 weeks of supplementation when compared to the placebo treatment. Based upon these results it was concluded that supplementing the diet and training with β -alanine does not result in an ergogenic effect as indicated by markers of muscle strength and changes in body composition.

Kendrick, IP, Harris, RC, Kim, HJ, Kim, CK, Dang, VH, Lam, TQ, Bui, TT, Smith, M, and Wise, JA. The effects of 10 weeks of resistance training combined with beta-alanine supplementation on whole body strength, force production, muscular endurance and body composition. *Amino Acids* 34:547 – 554. 2008.

Whey Protein Supplementation Increases Fat loss and Spares Lean Muscle in Obese Subjects.

Obesity is a worldwide epidemic that contributes to a multitude of health issues. One weight management method is manipulating the ratio of carbohydrates and protein in the diet. Through manipulating the diet it is hoped that a greater maintenance of lean body mass occurs while enhancing the decrease in body fat. One potential tool in this process is the use of whey protein supplementation. Based upon this line of reasoning the present study was designed to examine the effects of whey protein supplementation on fat loss and lean body mass. One hundred and fifty eight subjects between the ages of 20 – 50 years of age who had a bodymass index between 30 – 42 kg/m² were recruited for this investigation. All subjects had their dietary intake reduced by 500 kcals per day and consumed a whey protein shake or isocaloric placebo 20 minutes before breakfast and dinner each day for 12 weeks. Body fat and anthropometric measurements were taken every four weeks. Both the placebo and whey protein groups significantly decreased body mass. However, the whey protein group tended to lose more body fat (+1.19 – 1.52 kg), which corresponded to about 6.1% of their body fat mass. Since a 5% reduction in fat mass has been linked to a reduced disease risk in obese patients this finding is considered important. In addition to the fat mass loss the whey protein group tended to maintain more lean body mass. Based upon these findings the inclusion of whey protein supplements as part of a weight loss plan may result in more optimal losses of body fat when compared to simply reducing caloric intake.

Frestedt, JL, Zenk, JL, Kuskowski, MA, Ward, LS, and Bastian, ED. A whey-protein supplement increases fat loss and spares lean muscle in obese subjects: A randomized human clinical study. *Nutr Metab (Lond)* 5:8. 2008.

Does Vitamin C and E Supplementation Effect High Intensity Performance during Soccer Training?

It is widely documented that exercise training can increase the formation of markers of oxidative stress. Vitamin C and E are two powerful antioxidant molecules which can affect the formation of markers of oxidative stress. Several studies have demonstrated the potential ability of vitamin C and E supplementation of markers of oxidative damage in humans. However, very few studies have examined the effects of combining supplementation with training and how performance may be impacted. Therefore the present study was to examine the effects of vitamin C and E supplementation on markers of oxidative stress, muscle damage, and performance in elite soccer players. Ten male soccer players were randomly divided into two matched groups; 1) 1000 mg vitamin C and 800 mg of vitamin E and 2) maltodextrine. All supplements were administered in a double blind fashion and were consumed in conjunction with the subject's regular diets. Training loads were identical for the three month intervention. There were no differences in the markers of oxidative stress between the two treatment groups. However, the vitamin C and E group demonstrated significant reduced markers of muscle damage in response to the high intensity efforts associated with soccer training. Even though less muscle damage was noted there were no differences in actual performance measures between the two treatment groups.

Zoppi, CC, Hohl, R, Silva, FC, Lazarim, FL, Neto, JM, Stancanneli, M, and Macedo DV. Vitamin C and E supplementation effects in professional soccer players under regular training. *Journal of the International Society of Sports Nutrition* 3:37-44. 2006. ■



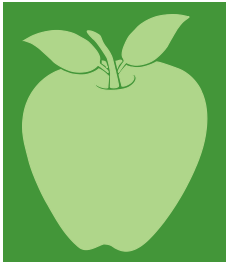
Sports Nutrition Program



presented by



www.nscalift.org/
NSCASportsNutrition/



about the AUTHOR

Donovan T. Santas was named Blue Jays Major League Strength & Conditioning Coach in January 2003 after serving as minor league coordinator since 2001. He graduated in 1999 from the University of Wisconsin La Crosse with a B.S. in Exercise and Sports Science, majoring in Strength and Conditioning. He is member of the National Strength & Conditioning Association (NSCA) and sits on the board of the Professional Baseball Strength & Conditioning Coaches Society (PBSCCS). In the offseason, he resides in Tampa, Florida with his wife, and devotes his free time to conducting youth athlete workshops on strength & conditioning and sports performance nutrition.

Do Athletes Maintaining Healthy, Well-Balanced Diets Really Need Nutritional Supplements

Donovan T. Santas, CSCS,*D

As a child how many times did you hear: “eat your fruits and veggies!”? As an adult, particularly as an athlete, eating fruits and vegetables is one of the only significant ways to get some of what the body needs from its food. Why? Because organically grown, antioxidant-rich fruits and vegetables represent one of the only nutritious food sources readily available. Unfortunately, getting your well-balanced daily servings of nutrient-rich food is a difficult task as most commercially processed foods are stripped of nutritional value and, worse yet, potentially full of toxins due to overuse of fertilizers, pesticides, and herbicides. This combination of over-processing and contamination not only fills our restaurants but also our supermarkets with high-calorie and/or high-glycemic and low-nutrient food options. Therefore, you have to be more diligent than ever to make quality food choices. And, as an athlete, to ensure peak performance and to ward off chronic degenerative diseases, you need to appropriately supplement a well-balanced, whole food-based diet for optimal nutrient levels.

In the world of serious and professional sports, supplements are arguably one of the most misunderstood and overwhelming topics. Adding to the confusion is the constant influx of the “next best thing” products, making too-good-to-be-true claims. Because athletes are always looking for an edge, they are often easy prey for the billion-dollar supplement industry marketing gurus. So what exactly are supplements? Are they replacements for whole foods, as some manufacturers would have you believe? By design, supplements should supplement, filling in the nutritional gaps of a quality diet. Generally, these nutritional gaps are seen as a lack of vitamins, minerals, and antioxidants. However for athletes, a lack of foods that enhance metabolism and prevent catabolism are also viewed as deficiencies.

The RDA and Optimal Levels of Intake

When examining nutritional deficiencies you need to be aware of the void between the Recommended Dietary/Daily Allowance (RDA) and Optimal Levels of nutrient intake of vitamins, minerals, and antioxidants. The RDA suggests standard intake levels to meet the minimum nutrient requirements for the majority of healthy individuals. In contrast, optimal levels are generally much higher than the RDA, and are based on what your body needs to function relative to your activity level and to avoid chronic degenerative diseases, like heart disease and cancer. In some cases, optimal nutrient levels can be as much as thirty times greater than the RDA. Because of strenuous physical demands, athletes consistently require optimal levels of most nutrients. However, to meet the optimal nutrient levels in some cases would require eating a substantial amount of foods rich in the needed nutrients. This is just not possible in most situations. Consequently, adding a high-quality multi-vitamin and mineral complex to your diet can ensure optimal levels of nutrients for recovery from intense activities and to boost your body’s immune system.

Another obstacle to filling nutritional gaps is an athletes’ schedule. Many times fast food, caffeine, and long gaps between meals are the common daily routine. Athletes need foods that will sustain their energy over long periods, not create roller coasters of blood sugar highs and lows. As such, you should always try to avoid high-glycemic carbohydrates, regardless of the time of day. The glycemic index (GI) measures a food’s immediate effect on blood sugar (2). The GI is based on a 1 to 100-point scale with pure glucose at 100. Refer to the table 1 to view ratings on representative foods. High-GI foods of 70 or more, like white bread, potatoes, jelly

beans, and corn flakes are converted to glucose quickly (2). While low-GI foods of 55 or less, such as rolled oats, apples, pasta, and yogurt are converted slowly (1). Making good quality low-GI carbohydrate choices throughout the day can maintain your energy levels naturally and eliminate the need for caffeine and other stimulants.

In addition to the GI, athletes should be acutely aware of the importance of protein in the building and repair of muscle. High-quality protein sources contain at least twice as much protein as fat. For example, a meat source with 10 grams of fat and 20 grams of protein is considered high quality but another protein source with a 10 to 10 ratio is considered only moderate to low quality. So chunk light tuna in water with 15 grams of protein and less than one gram of fat is an excellent source. Conversely, your typical fast-food cheeseburger with 20 grams of protein and a whopping 50 grams of fat is a poor source.

Although whole foods should be your primary source of quality calories, due to the demands of your schedule combined with many of the obstacles outlined above, the right foods will not always be accessible. This makes nutritional supplements a necessary adjunct to your diet. There are many meal replacement shakes and nutrition bars marketed to athletes but they are not all alike. Look for products that are low GI, low fat, high fiber, and protein rich. Just keep in mind when supplementing your meals and snacks that you are striving to maintain a well-balanced diet that consists of quality proteins, low-glycemic carbohydrates and a multitude of fruits and vegetables.

The Use of Supplements by Athletes

Despite research and supporting evidence that supplementing a healthy diet is necessary to attain optimal nutrient levels for sports performance, many athletes still avoid supplements altogether or simply jump from one product to the next with marketing trends. There are three primary reasons for this phenomenon:

Representative Food	Glycemic Index Rating
Glucose	100
Sucrose (table sugar)	61
Fructose (fruit sugar)	19
Cake Doughnut	76
Bran Muffin	60
Corn flakes	92
Apple	38
Baked Potato	85
Spaghetti	44
Banana	52
Carrots	47
Orange Juice	52
Bagel, white	72
Skim Milk	32
Spinach, leafy greens	0
Peanuts	14

Table 1

Glycemic Index of Selected Foods

A high GI Value is 70 or more.

An intermediate GI value is 56 to 69.

A low GI value is 55 or less.

- Misconceptions about dietary needs.
- Fear of banned substances.
- Lack of sports-certified products.

As mentioned previously, many athletes are not aware of the difference between the Recommended Dietary/Daily Allowance (RDA) and optimal levels. Nor do they know the extent of over processing and its nutrient-depleting affect on foods. Also, safety is always a top concern for athletes. Among those who understand the need for supplementation, many are scared off by fear of banned substances. Unfortunately, this fear is not unwarranted as quality control in manufacturing of nutritional supplements has only been loosely regulated since the implementation of the US Dietary Supplementation and Health Education Act of 1994. As a result of the act, there are currently no US regulations

that enforce minimum standards of practice, no requirements for pre-market approval, no post-market surveillance, and no site licensing or product licensing required for the manufacturing of dietary supplements in the US (3). This leaves quality and content basically unregulated, resulting in a supplement market flooded with ineffective products due to lack of proper formulation & dissolution properties and products with contents that do not match labeled ingredients.

In December 2007 the results of a study overseen by Informed-Choice, a nonprofit coalition of dietary supplements, and conducted by HFL, a British company, were released to the press. (1), Of 52 supplements purchased and tested by HFL, a quarter of the supplements contained traces of steroids and 11.5% had banned stimulants. This study came out only five years after

the International Olympic Committee (IOC) sampled 240 supplements purchased in America, revealing 18.8% contained steroids.(1) We can never be sure if the companies are intentionally adding banned substances in hopes of boosting product effectiveness, or if the machinery is just not properly cleaned between different productions. Regardless, the results are products that unsuspecting athletes assume are safe additions to their training and recovery programs, but could cause positive banned-substance tests.

Over the last decade banned substance testing has increased at all levels of competition, including high school, collegiate, and professional sports. This elevated level of testing has made supplement use a “buyer-beware” business and prompted numerous sports organizations to institute certification standards. For example, the National Football League (NFL) and Major League Baseball (MLB) have both adopted a certification program for supplements that relies on the independent testing company NSF. NSF Certified for Sport™ nutritional supplements are tested for accuracy in labeling as well as banned substances. Under NFL and MLB policies, teams can not supply players with uncertified products; however, players are free to make individual purchases of uncertified products at their own risk.

Use of only certified products greatly eases athletes’ anxiety over choosing supplements but it also greatly limits supplement options. Currently, there are as few as 20 certified products listed on the MLB approved list and only three multivitamins. Ideally, athletes should not deviate from certified products; however, due to limited availability you might elect to take uncertified products. In that case, it is wise to consume only those products that have voluntarily followed the Good Manufacturing Process that reflects the pharmaceutical model and are considered pharmaceutical grade as opposed to merely FDA regulated.

Although athletes should always take a food-first approach to their diet, less than adequate food sources and demanding schedules have created a need for quality supplementation to enhance performance, speed recovery, and prevent chronic degenerative disease. Yet the quality and safety of nutritional products will continue to be a major concern until more stringent production standards are imposed across the supplement industry. Until then, you should make a concerted effort to use only those products from companies that are willing to self impose more stringent regulations and meet certification requirements to set themselves apart from the rest of the market. Nonetheless, you should always

closely monitor your diet and make whole food choices that consist of a balance of fruits and vegetables, low-glycemic carbohydrates, and high-quality protein. ■

Reference

1. Associated Press. *Study: Quarter of Dietary Supplements Tested Contain Steroids, Banned Stimulants.* [Press release] (Thursday, December 06, 2007).
2. Brand-Miller, J, Foster-Powell, K. *The New Glucose Revolution.* New York, NY: Marlow & Company. (2006).
3. MacWilliam, L. *Nutrisearch Comparative Guide to Nutritional Supplements.* Vernon, BC Canada: Northern Dimensions. (2007).

about the
AUTHOR

Kyle Brown is a health and fitness expert whose portfolio includes everything from leading workshops for Fortune 500 companies and publishing nutrition articles in top ranked fitness journals, to training celebrity clientele—from pro athletes to CEOs to multiplatinum recording artists. Kyle's unique approach to health and fitness emphasizes nutrition and supplementation as the foundation for optimal wellness. After playing water polo for Indiana University, as well as in London, Kyle became involved in bodybuilding and fitness for sport specific training. Kyle is the creator and Chief Operating Officer for FIT 365—Complete Nutritional Shake (www.fit365.com).

Nutritional Quality vs. Nutritional Quantity: Properly Fueling Athletes for Optimal Performance

So many athletes are hung up on finding that “magic pill, powder, or potion” to give them a competitive edge. They spend hundreds of dollars monthly on the latest fad supplements, yet their nutritional foundation is pathetic at best. They use exercising for hours a day as a justification for their sub par nutritional intake of processed carbohydrates and convenience foods. Their bodies may look fit on the outside, which further justifies this rationalization. However, if more athletes put the same effort into being properly fueled as they do into training for their sport, their performance would increase exponentially (1).

There is a really big difference between nutritional quality and nutritional quantity. Nutritional quantity is what most people focus on. They think they know what is healthy because they look at the nutrition facts panel for the number of calories, grams of protein, carbohydrates, and fat. They first look at the calories and if it is some relatively low number like 200 or less they will think it is acceptable. Next, they look to see if the protein is over 10 grams, the fat is less than five grams, and the carbohydrates are less than 10 grams. If it meets these rough criteria they will deem the product as “healthy.” Instead, they should be focusing on the nutritional quality of the product. What ingredients make up the calories, grams of protein, carbohydrates, and fat and how will their bodies utilize these ingredients?

The key is to look at the history of nutritional degeneration (what did we do before we messed everything up) and what the rest of the animal kingdom is doing successfully. Most humans disassociated themselves from the source of where food comes from and are ignorant to how food serves as a source of fuel in their bodies. For example, protein is not just for building muscles but it provides you with sustained energy (2).

The basic premise is that certain foods are optimal for human consumption. We ate a particular way for roughly all but the last 10,000 years of our over 2.7 million years of human existence and our bodies have not adapted to processing these new man made or genetically modified convenience foods. On the other hand, our bodies adapted to an omnivore diet of healthy lean meats, veggies, a little fruit, healthy oils, and nuts and seeds (3).

Now that we are in the 21st century, how do we apply this prehistoric optimal way of eating into our chaotic, modern day lifestyle? A good rule of thumb is “if it does not spoil quickly, do not eat it.” Look for fresh, raw, organic foods that can be sourced by nature not a laboratory. As an athlete, if you put the same respect and effort into fueling your body as a race car crew does into fueling its car or a racehorse team does into nourishing its horse, you will have the competitive edge you are looking for. ■

References

1. Coyle, EF. Fat metabolism during exercise: New concepts. *Sports Science Exchange* #59, 8(6) 1996.
2. Ha, E, Zemel, MB. Functional properties of whey, whey components, and essential amino acids: Mechanisms underlying health benefits for active people (review). *Journal of Nutritional Biochemistry*. May;14(5):251-8. 2003
3. Cordain L. *Implications of Plio-Pleistocene Hominin Diets for Modern Humans*. In: *Early Hominin Diets: The Known, the Unknown, and the Unknowable*. Ungar, P (Ed.), Oxford University Press, Oxford, pp 363 – 83. 2006.

about the **AUTHOR**

Debra Wein is a faculty member at the University of Massachusetts Boston and adjunct lecturer at Simmons College. Debra is the President and Co-founder of Sensible Nutrition, Inc. (www.sensiblenutrition.com), a consulting firm established in 1994 that provides nutrition services to athletes, individuals, universities, corporate wellness programs and nonprofit groups. Debra is certified as a Specialist in Sports Dietetics (CSSD) through The American Dietetic Association. Her sport nutrition handouts and free weekly email newsletter are available online at www.sensiblenutrition.com.

Kathy Palmer has a degree in exercise science from the University of MA Boston, performed her internship at Tufts University's Friedman School of Nutrition in the Children In Balance Dep't and has worked with Sensible Nutrition since 2005.

Does Your Diet Pass Muster?

In order to achieve top performance, athletes require an appropriate quantity of energy (calories) and various nutrients (carbohydrates, proteins, fat, vitamins, and minerals) as well as the correct balance or quality of these nutrients.

The five tenets of good nutrition include...

- **Adequacy.** A diet which contains enough of the essential nutrients.
- **Balance.** A diet which contains a good proportion of nutrients. No overemphasis of one food group or another.
- **Calorie Control.** A diet which contains the correct amount of calories to maintain ideal body weight.
- **Moderation.** A diet which enables you to eat any food in reasonable-size portions.
- **Variety.** A diet which contains different types of food to prevent boredom.

To be sure you are achieving adequacy and calorie control, you need to be sure that your caloric intake is appropriate. Table 1 lists the different calorie needs for sedentary and active individuals for each age group. For more specific target and suggested energy intake levels for each age/gender group for go to The Center for Nutrition Policy and Promotion, Energy Levels For Proposed Food Intake Patterns (1).

To maintain your current weight, choose the amount suggested. To lose weight, decrease your calorie intake by 300 – 500 calories each day. For weight loss above 20 pounds, calories can be limited further as long as the total number of calories is not too extreme. To increase your weight, add an additional 300 – 500 calories daily. Once you have decided on an appropriate calorie level, refer to table 2 for specific amounts of servings to choose from each food group.

To track your intake over time or to simply look up the nutritional content of a specific food, refer to any of these sites:

- www.mypyramid.gov
- www.thedailyplate.com
- www.prevention.com
- www.sparkpeople.com
- www.calorieking.com (monthly or yearly fee) ■

Table 1
Calorie Requirements by Age (1)

AGE	CALORIE RANGE Sedentary / Active *
Children	
2 – 3 years	1,000 / 1,400
Females	
4 – 8 years	1,200 / 1,800
9 – 13	1,600 / 2,200
14 – 18	1,800 / 2,400
19 – 30	2,000 / 2,400
31 – 50	1,800 / 2,200
51+	1,600 / 2,200
Males	
4 – 8 years	1,400 / 2,000
9 – 13	1,800 / 2,600
14 – 18	2,200 / 3,200
19 – 30	2,400 / 3,000
31 – 50	2,200 / 3,000
51+	2,000 / 2,800

*Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life. Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life. For more strenuous activity, add the total calories burned during your activity to that total.

Table 2

Daily Amount of Food from Each Calorie Group

CALORIE LEVEL	1000	1200	1400	1600	1800	2000	2200	2400	26000	2800	3000	3200
Fruits	1 cup	1 cup	1.5 cups	1.5 cups	1.5 cups	2 cups	2 cups	2 cups	2 cups	2.5 cups	2.5 cups	2.5 cups
Vegetables	1 cup	1.5 cups	1.5 cups	2 cups	2.5 cups	2.5 cups	3 cups	3 cups	3.5 cups	3.5 cups	4 cups	4 cups
Grains	3 oz eq	4 oz eq	5 oz eq	5 oz eq	6 oz eq	6 oz eq	7 oz eq	8 oz eq	9 oz eq	10 oz eq	10 oz eq	10 oz eq
Meat and Beans	2 oz eq	3 oz eq	4 oz eq	5 oz eq	5 oz eq	5.5 oz eq	6 oz eq	6.5 oz eq	6.5 oz eq	7 oz eq	7 oz eq	7 oz eq
Milk	2 cups	2 cups	2 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups	3 cups
Oils	3 tsp	4 tsp	4 tsp	5 tsp	5 tsp	6 tsp	6 tsp	7 tsp	8 tsp	8 tsp	10 tsp	11 tsp
Discretionary calorie allowance	165	171	171	182	195	267	290	362	410	426	512	648

NOTE: If you require calories beyond 3200, simply find two tables that equal your caloric requirement and eat the recommended servings. For instance, for 4000 calories, double the suggested servings for the 2000 calorie recommendations.

Reference

- Center for Nutrition Policy and Promotion, Energy Levels For Proposed Food Intake Patterns. <http://www.cnpp.usda.gov/Publications/MyPyramid/DevelopmentMaterials/FedRegNoticeSept2003/table2.pdf>, accessed September 7, 2008. ■

about the
AUTHOR

Jason Brumitt is an instructor of physical therapy at Pacific University in Hillsboro, Oregon. He is a board certified sports physical therapist, an athletic trainer, and a certified strength and conditioning specialist with distinction. He may be reached at jbrumitt72@hotmail.com.

Recognizing Disordered Eating Habits in Athletes

Recent publications in the sports medicine literature have highlighted the prevalence and severity of eating disorders. Left untreated, eating disorders will cause serious detrimental health effects and possibly lead to death. Many coaches, athletic trainers, and administrators may be familiar with the classic eating disorder diagnoses of anorexia nervosa (AN) and bulimia nervosa (BN), but may be less familiar with the signs and symptoms associated with disordered eating. An athlete may possess signs of disordered eating that over time evolve into AN, BN, or a third condition known as an eating disorder-not otherwise specified (1).

Disordered eating is also associated with the female athlete triad, a medical condition consisting of low energy availability, amenorrhea, and osteoporosis (2). While a majority of the literature explores the prevalence of female eating disorders or the female athlete triad, male athletes may also be at risk. The prevalence of disordered eating in female athletes has been estimated to be as high as 62%, whereas as a surprising 33% of male athletes may demonstrate behaviors associated with disordered eating (1). The purpose of this article is to present the signs and symptoms associated with disordered eating. Due to the severity of these conditions, recognition of at risk athletes by a coach and/or an athletic trainer with the subsequent referral of the at-risk athlete to an appropriate medical provider is crucial.

Signs and Symptoms of Disorder Eating

Athletes who have eating disorders may demonstrate many physical or psychological characteristics (1 – 3). These behaviors include changes in eating habits (unnecessary dieting, not eating, secretive or ritualistic eating habits), changes in exercise behaviors (excessive exercise or unnecessary exercise), depression, restlessness, substance abuse, and issues related to body image (critical about one's own body appearance and feelings of being fat) (1).

Appropriate Responses to Suspected Disordered Eating

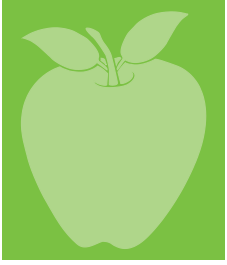
What should be done if you suspect that an athlete has an eating disorder? The National Athletic Trainer's Association published this year a position statement regarding the identification and management of athletes with disordered eating. The authors of the position statement recommend first that the athlete who is suspected of having an eating disorder be approached and questioned by an "authority" figure. The "authority" figure, such as a coach, athletic trainer, or teacher, should have a good relationship with the athlete. More than likely the athlete will deny having an eating disorder. If the signs and symptoms still suggest a problem, he or she should be referred to an appropriate physician for a medical evaluation (1).

Additional Reading

Each athletic program should implement a disordered eating "management protocol" in order to help facilitate the appropriate care for at risk individuals (1). One tool that may help an athletic department design and implement policies and procedures is the National Athletic Trainers' Association position statement on identifying and managing athletes with disordered eating (1). This publication may be accessed for free at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pubmed&pubmedid=18335017>. ■

References

1. Bonci CM, Bonci LJ, Granger LR, Johnson CL, Malina RM, Milne LW, Ryan RR, Vanderbunt EM. National athletic trainers' association position statement: preventing, detecting, and managing disordered eating in athletes. *J Athl Train*. 43(1): 80 – 108. 2008.
2. Nattiv A, Loucks AB, Manore MM, Sanborn CF, Sundgot-Borgen J, Warren MP; American College of Sports Medicine. American College of Sports Medicine position stand. The female athlete triad. *Med Sci Sports Exerc*. 39(10): 1867 – 1882. 2007.
3. Nattiv A, Callahan LR, Kelman-Sherstinsky A. The female athlete. In: Ireland ML, Nattiv A, eds. *The Female Athlete*. Philadelphia, PA: WB Saunders: 223 – 235. 2002.



about the AUTHOR

Amanda is the director of performance nutrition and research at Athletes' Performance (www.athletesperformance.com) and Core Performance (www.coreperformance.com). She earned her bachelor's degree in Nutritional Science from the University of Arizona and Master's degrees in both Sports Nutrition and Exercise Physiology from Florida State University.

Amanda works directly with the AP Performance Nutrition Team to help create year-long systems of success for all AP athletes and coordinates the company's performance research. Amanda delivers both educational seminars and individual consulting to a variety of professional and elite sports organizations, state and national conferences. She contributes to sports and fitness based publications, sits on various advisory boards for sports nutrition education development and position papers, and has edited sports nutrition books and educational texts.

Ten Simple Things to Remember for Optimal Nutrition

Amanda Carlson, MS, RD, CSSD

Nutrition is something that affects everyone. Everyone needs fuel and everyone needs nutrients. Yet everyone eats for completely different reasons. As an athlete on the field or as an athlete competing in the game of life, putting thought behind what goes into your mouth can do wonders for health, but most importantly performance. The thought process behind choosing the right foods or combinations of foods seems to be the most paralyzing for most athletes. There are so many different opinions, ways of doing things, answers to weight loss, answers to weight gain everywhere you turn that it can become confusing to a point where acting on good intentions seems to halt. By no means do I want to downplay the complexity of nutrition, but what does all the science matter if behavior does not change? In working with athletes over the years, we break down our methodology into “10 Rules to Live by” that can be simplified to five categories: eat clean, eat often, hydrate, recover, mindset. These five categories will allow us to assist our clients in streamlining their healthy eating efforts.

10 Rules to Live By:

1. **Come Back to Earth.** This simply means to choose the least processed forms of foods, specifically carbohydrates, when building the majority of your meals. Typically the less processed the foods and the closer the food that you are eating is to its natural state, the better it will be for you. An easy way to do this on the carbohydrate side of things is to simply look at the label and the amount of fiber that is in the product. If the product has at least three grams of fiber or more per serving, it is a good choice. If it does not have that amount of fiber, put it back and find something that does. According to the American Heart Association, Americans eat an average of 15 grams of fiber per day, which is far

below the 2005 Dietary Guidelines for Americans of 14g per 1,000 calories consumed) that is recommended (5). The total intake of carbohydrates in general should be based on size and activity level. Typically this will range from anywhere between 3 – 10g of carbohydrates per kg body weight with the lower end (three grams) representing the light training recreational athlete to the upper end (10g) representing the endurance athlete in a heavy training phase. In the real world, if you feel energized, recover fully, are at a healthy performance weight, and are performing—you are probably eating the right amount of carbohydrate.

2. **Eat a Rainbow Often.** The vitamins and minerals that our body's need naturally come from the foods that we eat, specifically fruits and vegetables. Eating a variety of fruits and vegetables in a multitude of colors will help to ensure that you are getting the variety of nutrients that you need. Gone are the days of the “5 a Day” campaign. It has been replaced with simply, “More Matters.” Some of the best fruits based on their total anti-oxidant capacity per size are blueberries, blackberries, raspberries, strawberries, granny smith apples, sweet cherries, and black plums. In terms of vegetables, the Harvard school of public health is a bit more general in its guidelines by recommending to reach for stewed tomatoes, dark leafy greens, and anything that is rich in yellow, orange, and red color. It all sounds so simplistic, but still the average American only consumes about three out of the five to 15 recommended servings per day. The athlete needs the nutrients in these foods to enhance recovery, serve as intermediates in energy production, and an improved immune system.

3. **The Less Legs the Better.** Protein is a critical part of the diet for the athlete and the active person, specifically the type and the amount. When focusing in on the type of protein, typically the less legs the animal has before you actually consume it, the better the source. Fish, turkey, and chicken rank high. You need to be more selective with dairy, red meat, and pork products. Low-fat dairy, lean cuts of pork and beef, and grass fed four legged animals are best. For people who are active in both strength and endurance training, more protein is needed; however, the constant debate always appears as to how much protein people need. Research suggests 1.2 to 1.7g/kg for both strength training and endurance athletes (7). Meeting the upper level of protein needs while decreasing calories is important to maintain muscle mass while trying to lean out. Protein also has a higher “thermic effect” meaning more calories burned, which can further help the leaning out effort (8). Protein can help to increase the satiety of meals and should also be included as part of your recovery meal or snack. Splitting the total protein intake over the course of the day by including some in each meal will help to ensure absorption and utilization.
4. **Eat Fats That Give Something Back.** Diets too low in fat can be detrimental to active people; however, diets too high in fat (as with anything) will lead to increased fat accumulation. It is recommended that 20 – 30% of the total calories come from fat. The best types of fats to include are raw nuts, seeds, olive oil, nut butters, and fatty fish. The forgotten fats in the US are the essential fatty acids, specifically the omega-3 fatty acids. These fatty acids help with decreasing inflammation and due to their essential nature, must come from the diet. You should consume fish high in omega 3 two to three times per week. Those who do not consume fish regularly may want to consider supplementing with fish oil.
5. **Three for Three.** Eating consistently maintains energy levels (blood glucose), keeps

Eat Clean	1	2	3	4	5
Eat Often	1	2	3	4	5
Hydrate	1	2	3	4	5
Recover	1	2	3	4	5
Mindset	1	2	3	4	5

Table 1

Performance Nutrition Assessment

(5 = “Great;” 1 = “Not So Great”)

the body in a fed state, and prevents mood swings and binging. Keeping the body fueled will prevent extreme hunger, which will make healthier food selection easier. Combining the three main nutrients (carbohydrates, protein, fat) every three hours (hence the three for three) will keep you fueled and keep you on track. Planning out meals and snacks ahead of time will ensure that you stick with your fueling regimen. Keeping healthy snacks, bars, and ready to drink meal replacements with you at all times will ensure you have fuel on hand to keep you going.

6. **Eat Breakfast Everyday.** There is a lot of debate on this in the literature, but I still believe that eating breakfast everyday is critical and find it to be an absent habit for most of us. “There isn’t enough time,” “I’m not hungry in the morning,” and “it’s too complicated” are all things that I hear come out of the mouths of athletes and in my own brain at times. Breakfast does not have to be buckwheat pancakes and an egg white omelet. Breakfast could be a blend of yogurt, flax, whey protein, and frozen berries or whole wheat toast, peanut butter, and a banana. Eating breakfast will give the body the fuel it needs, jumpstart the metabolism, and set people up to consume the number of calories they should be eating throughout the day.
7. **Hydrate.** Dehydration = Decreased performance. The 2007 American College of Sports Medicine (ACSM) position stand on exercise and fluid replacement states that the goal of drinking while exercising is to prevent a 2% loss in fluid and an ex-

treme disruption of electrolyte balance. (1) However, we need to ensure that we are hydrated before we step onto the field or into a training session. A case study performed at Athletes’ Performance in 2008 on NFL combine preparation athletes found 98% of them to be dehydrated (by means of urine gravity) prior to their am training session. This resulted in a quick review of the athletes hydration. When we think of hydration we need to think of it in terms of all day and during training. We recommend drinking ½ oz to 1 oz per pound of body weight per day. Fluids should consist of primarily water and other naturally low or non caloric beverages, followed by 100% fruit juices (depending upon calorie requirements). This is a good range that helps people reach baseline recommended fluid intakes of 2.7L/day for women and 3.7L/d for men. In order to prevent dehydration during exercise, it is recommended by the ACSM to create an individual approach to minimizing fluid loss during training by weighing in and out of sessions and tracking how much fluid is consumed. A general place to start as recommended by the National Athletic Trainers Association (NATA) is to drink 17 – 20oz prior to exercise, 7 – 10 oz every 10 – 20 minutes during exercise, and 17 – 24oz for each pound lost during exercise (3). During times of intense activity, extreme temperatures, and long duration, a carbohydrate electrolyte beverage is optimal in addition to water because it is imperative to replace both water and salts lost from sweat. The fluid replacement is critical for those training two or more times

per day in order to maintain performance at subsequent training bouts.

8. Don't waste your workout. Even with the plethora of research available on the benefits of post workout nutrition, I still see athletes and workout warriors skipping the recovery meal or snack. The mindset of many still involves a hesitation to consume calories after just burning them. In order to optimize the benefits of a training session and jumpstart recovery for maximal gains, it is critical to consume a post workout recovery meal that blends both carbohydrate and protein within 45 minutes after training. This recovery meal should contain a repletion factor of 1.2 – 1.5g/kg bodyweight that combines both carbohydrate (1.0 – 1.2g/kg bodyweight) and a blend of whey and casein protein (0.3 – 0.4g/kg bodyweight) in a ratio that ranges from 2:1 to 4:1 depending upon the intensity and duration of the training. By consuming this snack, meal, shake, or bar that hits your protein and carbohydrate requirements as quickly as possible after training, glycogen repletion, lean body mass gains, performance on a subsequent training bout and immune function will be optimized (2,4,6).

9. Supplement wisely. There are so many supplements on the market that it becomes difficult to decipher which ones are needed. Supplements should “compliment” the diet and a mentality of food first supplement second should be employed; however, there are a number of situations that warrant a basic supplementation protocol. Those who do not get the recommended three servings of fatty fish per week should consider supplementing with an Essential Fatty Acid supplement. Those who do not get the calcium they need, especially female athletes, should consider a calcium supplement. Supplements that reach beyond that scope can be taken, but should be chosen only after an evaluation with a doctor and dietitian. When choosing any supplement, make sure that it has a Good Manufacturing Practice

Time	Meal
5:00 AM	Wake-up
5:15	Whole wheat toast w/peanut butter, yogurt
6:00 – 7:15	Workout
7:30	Post Workout Shake w/ Carbohydrate and Protein
9:30	Oatmeal w/berries and walnuts, egg whites scrambled with veggies, low fat cheese and olive oil
12:30 PM	Turkey sandwich on whole wheat with large spinach salad and low fat dressing
3:30	Plum w/raw almonds
6:30	Grilled salmon, brown rice, steamed veggies, large green salad w/low fat dressing
9:30	Low fat cottage cheese and ½ c berries

Table 2

Sample “Perfect Day” Nutritional Plan

(GMP) symbol, is free of banned substances, and has accuracy in labeling. Utilizing websites such as consumerlab.com, nsf.org, and informedchoice.org can be very helpful.

10. Get back in the kitchen. In a world of convenience, travel, and life on the go, we turn to restaurants, fast food, and “quick” food for our nourishment. Restaurants, regardless of the type, do not take into consideration your calorie needs or your health when deciding upon their menu. Eating out is tricky as the majority of items are oversized and have significantly more fat and calories than similar dishes made at home. At the end of the day, if you really want to maximize your body composition, hit your nutrient and calorie goals, and just eat cleaner, you are your best ally. The more you can prepare your own food, the more control you will have in the nourishment of your body.

We simplified this further by breaking the 10 Rules down into 5 categories: Eat Clean, Eat Often, Hydrate, Recover, and Mindset. Each category represents a very important piece when it comes to fueling the body for performance and for health. In order to stay on track, we ask our athletes and clients to gauge how they are doing with a simple “Performance Nutrition Assessment” on a daily basis (table1). We have them rank on a scale of 1 to 5 each of those 5 categories. This daily check point serves as a time to reflect on how well they are nourishing their body despite the busy nature of life.

When it comes down to nutrition, there is not one answer, one magic pill, one supplement, or one tip that will give you the results you are looking for. It involves taking the 10 tips above and creating “Perfect Days” (table 2) and mastering the consistency of implementing the strategies listed above into daily life until it becomes a habit. So, how are you doing? ■

References

1. American College of Sports Medicine. Position stand: Exercise and fluid replacement. *Med Sci Sports Exer*, 28(1): i – vii. 2007.
2. Berardi, JM, Price, TB, Noreen, EE, Lemon PW. Postexercise muscle glycogen recovery enhanced with a carbohydrate-protein supplement. *Med Sci Sports Exerc*, 38(6):1106 – 13. 2006.
3. Casa, DJ, Armstrong, LE, Hillman, SK, Montain, SJ, Reiff, RV, Rich, BSE, Roberts, WO, Stone, JA. National Athletic Trainers' Association position statement: Fluid replacement for athletes. *Journal of Athletic Training*, 35(2): 212 – 224. 2000.
4. Coyle, E.F. Timing and method of increased carbohydrate intake to cope with heavy training, competition and recovery. *Journal of Sports Sciences*, 9(suppl.)Spec No:29 – 51; discussion 51-2. 1991.
5. Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients). National Academies Press. 2002.
6. Ivy, JL, Katz, AL, Cutler, CL, Sherman, WM, Coyle, E. Muscle glycogen synthesis after exercise: effect of time of carbohydrate ingestion. *Journal of Applied Physiology*, 64, 1480 – 1485. 1988.
7. Manore, A, Barr, S, Butterfield, G. Position Stand of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and athletic performance. *Journal of the American Dietetic Association*, 12: 1543-1556. 2000. Phillips, S. Dietary Protein for Athletes. *Appl. Physiol. Nutr. Metab*, 31: 647 – 654 2006.