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OLYMPIC COACH

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**Message from the
DIRECTOR OF
COACHING and
SPORT SCIENCES**

**NEVER GET HUNGRY,
NEVER GET THIRSTY:
A Drug-Free Nutritional
Strategy for Optimizing
Athletic Performance**

**NUTRITION
PERIODIZATION
for Endurance Athletes**

**Enhancing Performance
Through Nutrition—
EAT TO COMPETE!**



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COVER IMAGE

Top: Mariel Zagunis of Team USA competes in the women's fencing individual sabre gold medal match August 17, 2004 during the Athens 2004 Summer Olympic Games at Helliniko Olympic Complex Fencing Hall in Athens, Greece.

Bottom: Later, Mariel Zagunis (left) and Sada Jacobson (right), celebrate with gold and bronze medals respectively. (Photos by Adam Pretty/Getty Images)

Message from the
USOC's
DIRECTOR OF COACHING
and SPORT SCIENCES
by
PETER DAVIS, Ph.D.

Welcome to the latest edition of *Olympic Coach*. This time we have decided to focus on the topic of Sports Nutrition. This is a sometimes difficult and confusing area for coaches and athletes and many coaches struggle with integrating sound nutritional concepts and practices into their overall plan. A coach can develop a quadrennial plan, write workouts, co-ordinate training with the Strength and Conditioning coach...all of which they can be responsible for and exert direct control; but nutrition is an area that is often outside the direct control of a coach. You can't be with an athlete for every meal and snack of the day and night.

We know (and the articles in this issue confirm) the vital importance of nutrition in performance and recovery. You might think that nutrition is a very small component within training (but you would be wrong), but if it's not done properly, it can have a major (negative) impact on performance. We have seen great Olympic athletes, who have not accomplished their dream, due to what they have eaten or drank before or during competition. The time and energy that the coach and athlete have used to develop great competitive strategies can be diminished or even destroyed by diet. Likewise a well-planned-out nutrition program can significantly enhance a well-structured training, recovery or competition plan.


Talking to your athletes about nutrition and weight control can be a minefield, particularly when talking with your female athletes. Dr. Sean McCann provides us with some great insight into why this can be troubling and offers some suggestions on getting around the emotional minefield that nutrition poses for some athletes.

Bob Seebohar provides some excellent suggestions of what to eat and when to emphasize particular foods based on your periodization in training. This is a concept that is really taking hold with many elite level athletes and is an extremely effective way to enhance the training and recovery program.

Dr. Dan Bernadot, worked with the two Olympic medalists in the Marathon (Deena Kastor and Meb Keflezighi) and was part of the Performance Enhancement Team that developed the race and training plan for the Athens Olympic marathon. His explanations of the mechanics of heat production, energy usage and energy intake points out the reasons for having a nutritional understanding for training.

If you are looking for clear and concise guides for nutritional intake for competitions and training, take a look at Jackie Maurer's article.

Also in this issue our colleagues at the American College of Sports Medicine have provided us with a very insightful article by one of the leading researchers in Coaching Effectiveness and Behaviors. Dr. Wade Gilbert and Catherine Jackson's provocative article "*In Search of an Effective Coaching Style*" is one that will cause coaches to reflect on how we do what we do.

Enjoy this edition of *Olympic Coach*, and as always, if you have suggestions or comments about our articles, or future topics please feel free to share them with us. 



NEVER GET HUNGRY, NEVER GET THIRSTY:

A Drug-Free Nutritional Strategy for Optimizing Athletic Performance

by Dan Benardot, Ph.D., DHC, RD, FACSM

About the Author:

Dan Benardot is Associate Professor of Nutrition and Associate Professor of Kinesiology and Health at Georgia State University. He is author of "Nutrition for Serious Athletes" ©2000, Human Kinetics, co-author of the "ACSM Fitness Book, 3rd Edition" ©2004, Human Kinetics, and Editor-in-Chief of "Sports Nutrition: A Guide for Professionals Working with Active People," 2nd Edition ©1994, the American Dietetic Association. He is currently working on "Advanced Sports Nutrition," to be published by Human Kinetics in 2005. He was a nutritionist for the Gold-medal winning Gymnastics Team at the 1996 Atlanta Olympic Games and the medal winning marathoners at the 2004 Athens Olympic Games.

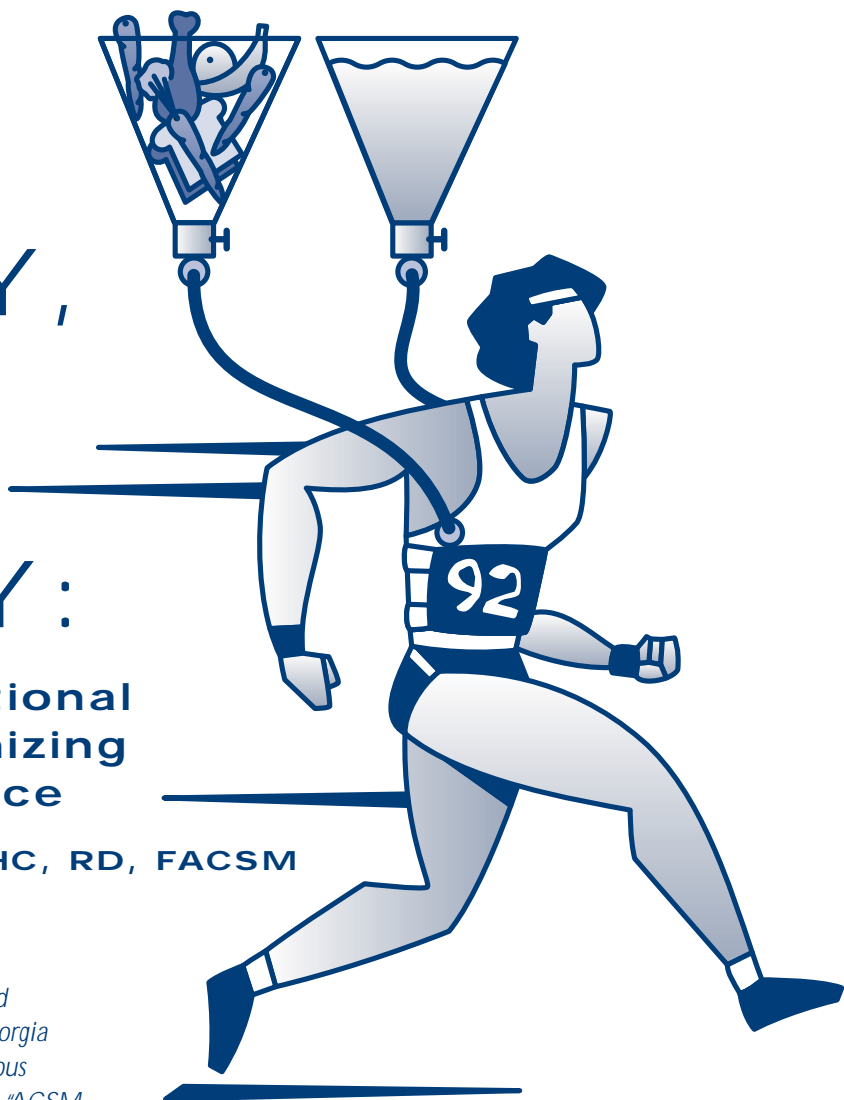


INTRODUCTION

Exercise has two effects on nutrient requirements.

It results in an increase in the *rate* of energy usage and, because of the greater heat production associated with higher levels of energy metabolism, an increase in

the *rate* of water lost as sweat. It should be widely understood that athletes need to increase energy substrate and fluid consumption to meet this additional nutritional burden, yet nutritional surveys suggest that athletes don't eat enough and don't drink enough.^{1,2,3} Moreover, it appears that energy consumption is not well timed, which negatively impacts both body composition and performance.^{4,5,6}



The outcome of this widespread athletic malnutrition is all too well understood: An excessive reliance on supplements and ergogenic aids to overcome the deficits created by inadequate energy and fluid consumption. It is likely that athletes who pay attention to food and drink intake will do more to achieve at their conditioned capacity than any other action they can take. Focusing on food and drink is a less expensive, more dependable, and a safer strategy for improving athletic performance than relying on supplements and ergogenic aids, which may have indefinite content and unpredictable quality.

ENERGY INTAKE

Much of the discussion on energy intake focuses on the optimal distribution of the energy substrates: carbohydrate, protein, and fat. (Although there is no question that focusing on a diet high in complex carbohydrates, moderate in protein, and relatively low in fat is performance enhancing.) But this discussion has little meaning in the face of energy intake inadequacy. Put simply, it doesn't matter if you put high-octane fuel in the system if there isn't enough fuel to get you where you want to go. Weight and lean mass stability are the best indicator that energy intake matches need. A failure to consume sufficient energy leads to either a reduction in weight or a reduction in lean mass (or both), as the body tries to compensate for this deficiency. For

most athletes, a lower relative lean mass and higher relative fat mass is not desirable and is a physiological marker associated with decreased performance. In what must be considered a terribly wrong reaction to this relatively higher fat mass, athletes commonly reduce energy intake still further to reduce the fat mass. The impact of this constant ratcheting down of energy intake is weight loss with a greater loss of lean mass than fat mass, with fat constituting an ever-higher proportion of body weight.^{7,8}

It is possible that this cycle of lowering energy intake to adapt to a constantly rising relative fat mass is predictive of the eating disorders seen too often in athletes where 'appearance' is a factor in a sport's subjective scoring.⁹ To emphasize this point, it should be noted that anorexia nervosa victims at death have a terrible loss of weight, a terrible loss of lean mass (the weight of the heart is typically 50% of normal), but a relatively high body fat percent. Severely deficient caloric intakes, therefore, lead to a greater cachexia of lean mass than fat mass.¹⁰ The concept that a significant reduction in calories (i.e., 'dieting') results in an improved body profile and body composition simply does not stand up to scrutiny. While a short-term subtle lowering of body weight may be temporarily associated with an enhanced performance, the long-term effects of such low-calorie 'diets' is to lower the intake of needed nutrients (a problem that can manifest itself in disease frequency and increased risk for low bone density) and to regain the weight, which is made up of less lean and more fat. To make matters worse, the lowering of lean mass makes eating normally without weight gain more difficult.

A micro-economic view of the energy balance issue may shed some light on how athletes should eat to achieve an optimal body composition that enhances performance. A study of 4 groups of national-level female athletes (rhythmic gymnasts, artistic gymnasts, middle-distance runners, and long-distance runners) found that those who deviated most widely from perfect energy balance *during the day* had the



highest body fat levels, regardless of whether the energy deviations represented surpluses or deficits.¹¹ This strongly suggests that the common eating pattern for athletes, which is typified by infrequent meals with a heavy emphasis on a large end-of-day meal, is not useful for meeting athletic goals because it is guaranteed to create large energy deficits during the day. While this energy deficit may be made up for at the end of the day to put an athlete in an 'energy balanced' state, this type of eating pattern is typified by weight stability but higher than desirable body fat levels.

Understanding that blood sugar fluxes every three hours (after a meal, it rises, levels off, and drops in three hours), the reason for the higher body fat level becomes clear. With delayed eating, blood sugar drops and the amino acid alanine is recruited from muscle tissue to be converted to glucose by the liver. While this stabilizes blood sugar, it does so at the cost of the muscle mass. In addition, both low blood sugar and large meals are associated with hyperinsulinemia, which encourages the manufacture of fat. So, delayed eating followed by an excessively large meal, which is typical of the athletic eating paradigm, is an ideal way to lower muscle mass and increase fat mass... not what athletes want to do. A number of studies that have assessed eating frequency have come to the same



conclusion: the more frequent the eating pattern, the lower the body fat and the higher the muscle mass.^{12,13,14,15} Frequent eating reduces the size of within-day energy deficits and surpluses, and helps to stabilize blood sugar.

Athletes concerned about weight have, for a long time, learned to cope with the feeling of low blood sugar by consuming a diet product (diet colas are popular). While these diet products do nothing to resolve the very real physiological need for energy to maintain an adequate blood sugar, they do provide a central nervous system stimulant (usually caffeine) that masks the sensation of hunger. However, since the status of the blood sugar is maintained at a low level through this strategy, the outcome will inevitably be less muscle and more fat. It is clear from these studies that the only appropriate strategy of weight loss is a subtle energy deficit that results in only a slight deviation from a within-day energy-balanced state.

What are athletes to do? *Never get hungry.* This is not easy on a typical 3-meal-a-day eating pattern, which provides for a refueling stop every 5 to 6 hours, and it is less easy on typical athlete eating patterns which heavily backload intake. Since blood sugar is known to rise and fall in 3 hour units, it makes sense to have planned snacks. If you're weight stable, the best way to initiate this process so you don't eat too much is to eat a bit less at breakfast, and eat the remainder at mid-morning, and do the same for lunch and dinner. Total caloric intake will remain the same, but the athlete will avoid sharp energy deficits and surpluses during the day. Besides the improved nutrient intake, and better body composition associated with this type of eating pattern, athletes can also expect improved mental acuity and enhanced athletic performance.

FLUID INTAKE

Perhaps the single most important factor associated with sustaining a high level of athletic performance is maintenance of blood volume during exercise. Despite this, studies have demonstrated that, even in the presence of available fluids, athletes experience a degree of voluntary dehydration that lowers blood volume and negatively impacts performance.¹⁶ Given the tremendous amount of heat that must be dissipated during exercise through sweat evaporation, athletes have no reasonable alternative for sustaining exercise performance than to pursue strategies that will sustain the hydration state. Failing this will result in, at a minimum, premature fatigue and may also lead to potentially life-threatening heat stroke.

Temperature regulation represents the balance between heat produced or received (heat-in), and heat removed (heat-out). When the body's temperature regulation system is working correctly, *heat-in* and *heat-out* are in perfect balance and body temperature is maintained.¹⁷ The two primary systems for dissipating or losing heat while at rest are to move more blood to the skin to allow heat dissipation through radiation and to increase the rate of sweat



production. These two systems account for about 85% of the heat lost when a person is at rest, but during exercise virtually *all* heat loss occurs from the evaporation of sweat.

Working muscles demand more blood flow to deliver nutrients and to remove the metabolic by-products of burned fuel, but at the very same time there is a need to shift blood away from the muscles and toward the skin to increase the sweat rate. With low blood volume, one or both of these systems fail, with a resultant decrease in athletic performance.


Heavy exercise can produce heat that is 20 times higher than the heat produced at rest. Without an efficient means to remove this excess heat, body temperature will rise quickly. (The upper limit for human survival is about 110° F, or only 11.5° F higher than normal body temperature.) With the potential for body temperature to rise at the rate of about 1°F every 5 minutes, it is conceivable that underhydrated athletes could be at heat stroke risk only 55 minutes after the initiation of exercise.¹⁸

Athletes working hard for 30 minutes would create 450 kcal of excess heat that would need to be dissipated to maintain body temperature. Since 1 ml of sweat can dissipate approximately 0.5 calories, athletes would lose about 900 ml (almost 1 liter) of sweat. In one hour of high intensity activity, approximately 1.8 liters of water would be lost. On sunny and hot days when the heat of the sun is *added* to the heat produced from muscular work, athletes would need to produce even more sweat to remove more heat. Sweat doesn't evaporate off the skin as easily when it is humid, so still more sweat must be produced in hot and humid weather. Well-trained athletes exercising in a hot and humid environment may lose over 3 liters of fluid per hour.¹⁹

No level of *low* body water is acceptable for achieving optimal athletic performance and endurance, so athletes should have a strategy for *maintaining* optimal body water during exercise. The problem is that athletes often rely on *thirst* as the marker of when to drink. Since the thirst sensation only occurs *after* a loss of 1 to 2 liters of body water, relying on thirst is an inappropriate indicator of when to drink.²⁰ Instead, the athlete should strategize on how to

never get thirsty. Ideally, this strategy should involve helping athletes determine how much fluid is lost during typical bouts of physical activity, and developing a fixed fluid consumption schedule from that information (typically 3 to 8 ounces every 10 to 15 minutes of a sodium-containing 6–7% carbohydrate solution.)


SUMMARY

Both hunger and thirst are emergency sensations marking the onset of performance-reducing problems. As such, they should be avoided through a planned eating and drinking timetable that is integral to the athletes' training schedule and lifestyle. Perhaps no other two factors have the potential for making such an enormous positive impact on health and performance. Put simply, athletes interested in performing up to their conditioned abilities and skill levels should *never get hungry* and *never get thirsty*. 

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PERIODIZATION for Endurance Athletes

by
Bob Seebohar, MS, RD, CSCS

Bob Seebohar is the Director of the Colorado Altitude Training and Performance Center in Evergreen, Colorado. He is a Sports Dietitian, an Exercise Physiologist and a USA Triathlon Certified Expert Coach.

Many endurance athletes structure their physical training based on periodization principles in order to achieve peak performance during their competitive season. While many endurance athletes watch what they eat and sometimes maintain very strict, or even superstitious eating habits, many do not employ the periodization principle to the nutrition aspect of their training. More often than not, athletes are physically and mentally prepared for competition, but lack the ability to structure their eating throughout the year based on their physical training cycles.

Nutrition periodization is very important for any endurance athlete. By following the principles outlined below, the endurance athlete can use the food they eat to not only provide the energy needed to support their physical training and maintain adequate glycogen stores, but also use food to maintain a healthy immune system and ward off illness, prevent vitamin and mineral deficiencies, speed recovery from hard training sessions, lose or gain weight, and positively alter body composition.

The following nutrition periodization principles are separated into the different physical training cycles that endurance athletes, young or old, novice or elite, will encounter throughout a training year.

Some of dietary recommendations listed in each cycle can be applied to other cycles but they are categorized under their most applicable cycle below.

BASE (or Preparatory) CYCLE:

"Do's"

- Eat a minimum of six to eight servings of fruit and vegetables per day to ensure an adequate intake of vitamins and minerals.

- Choose high fiber foods. Insoluble fiber promotes regularity while soluble fiber helps to lower cholesterol levels. While regularity may not seem beneficial during this cycle, the consequences could be great. Constipation can cause severe bowel distress and can lead to stomach aches, which may lead to missed training sessions.
- Experiment with new foods.
- Experiment with different energy bars, gels and sports drinks during this stage in order to choose the products that work best to use in later cycles.
- Along with the above suggestion, try to find out what nutritional products will be used at races and try them. Longer endurance races (3 hours or more) usually require food and fluid assistance from the race volunteers, so be sure to try these products before using them. For endurance races lasting one to three hours, it is possible to carry adequate food and fluids and not depend on race course assistance.

"Don'ts"

- Forget about the environment. If it is cold, it is still necessary to drink adequate fluid-enough to produce a clear to lemonade color urine throughout the day.
- Get in the rut of eating the same thing everyday. Rotate through different foods and menus in order to promote more variety and balance.

INTENSITY (or Build) CYCLE

"Do's"

- Choose the energy bars, gels and sports drinks that worked best in the last cycle and use them for the remainder of the season.

- Eat often—at least six times per day. Snacking is beneficial in this cycle in order to maintain blood glucose levels.
- Think about using salt tablets or additional electrolyte replacements. Depending on the environmental conditions, these could be of benefit. Try them during your training sessions when the environmental conditions are challenging. Salt tablets are not recommended for all athletes, so be sure to experiment first.

“Don’ts”

- Skimp on the calories. More than likely, training intensity has increased and nutritional intake must also be increased to support this level of training.

PEAK (Taper) CYCLE

“Do’s”

- Think about a lower fiber diet for longer distance races in order to decrease bowel movements during a race. Fruit juice is a great choice since there is no fiber and it contains adequate vitamins and minerals.
- Keep hydrated.
- Add extra salt to your diet for races that will last longer than four hours. Begin about two weeks before the event and be generous with the salt shaker. For a healthy athlete, it would be safe to add an extra ½ –1 teaspoon of salt per day. This is considering that there are no pre-existing health conditions that could be affected by an increased sodium intake and that fluid intake is proportionately increased at the same time.

“Don’ts”

- Try anything new.
- Form a new eating routine. Stick with what has worked in the past two cycles.

RACE CYCLE

“Do’s”

- Stick with the energy bars, gels and sports drinks that have worked during the base, intensity, and peak cycles.
- Develop a pre-race eating routine with specific foods and beverages and specific timing of foods.
- Increase calories and carbohydrates the week or weeks leading up to a race and have the largest carbohydrate rich meal two to three nights before a race (not the night before since the simple rules of digestion suggest the improbability of the food being fully digested and out of the digestive tract by race day).
- Continually snack on high carbohydrate foods the day before a race. Eat every couple of hours.
- Eat breakfast. Energy stores are low in the morning due to the overnight fast so it is important to replenish the calories used during the sleep hours (for brain function, heartbeat, and breathing).

“Don’ts”

- Try anything new, especially on race day.
- Carbo-load the night before a race. It takes 24–72





hours to fully digest a meal (from entry to exit) depending on the composition and quantity of food eaten.

- Drink too much water. Hyponatremia can develop as a result of consuming too much water because it displaces extra-cellular sodium. This is why drinking a sport drink is of benefit.

ACTIVE RECOVERY OR (TRANSITION) CYCLE

“Do’s”

- Put the energy bars, gels and sports drinks in the back of the cupboard for a while to give the body a break from them.
- Re-introduce whole foods from all of the food groups to acquire vitamins and minerals from foods rather than bars, gels, and drinks.
- Try new restaurants and foods. Be adventurous and think outside of the box. Foods prepared a different way or from a different culture are good sources of nutrients and provide a break from the “norm.”
- Try to lose weight safely and realistically. Since there is not much structure or strict training guidelines during this cycle, a weight loss of one to two pounds per week is safe, realistic, and will not have a negative impact on training.

“Don’ts”

- Overeat. It is very easy to gain weight in the off-season without realizing it. A weight gain of two pounds per month can happen by simply overeating by 250 calories per day!
- Forget about the environment. If this cycle falls in the winter where there is not much sunshine, it is common to eat more comfort foods, which can be very high in calories and tend to increase body weight and body fat.

THE FOLLOWING NUTRITION PRINCIPLES APPLY YEAR-ROUND REGARDLESS OF TRAINING CYCLE:

“Do’s”

- Choose foods rich in beta-carotene, vitamin C, vitamin E and zinc to improve immune function. Current research studies lend support that these vitamins and minerals may be of benefit to improve immune function, although the data is still inconclusive.
- Choose more polyunsaturated (fish) and monounsaturated (nuts, canola and olive oil, avocados, olives) fats rather than saturated fats (high-fat meats, butter, lard, processed foods such as cookies and chips) for improved heart functioning.
- Consume a high-glycemic index carbohydrate source (baked potato, vanilla wafers, jelly beans, watermelon,

bagel) combined with a lean protein within the first 15 minutes after training or a race. Examples are a sports drink with a cup of yogurt, watermelon and chocolate milk, a lean meat sandwich minus the mayo. There are also commercially available products that provide the same effect. Some promising research has shown that a ratio of 4:1 carbohydrates to protein is beneficial for enhancing glycogen storage and quicker recovery.

- Think about taking a multivitamin that has no more than 100-200% Daily Value (DV) for nutrients (a child's chewable multivitamin/mineral is perfect for adults). Remember, you are also eating energy bars and supplements chock full of vitamins and minerals so your multivitamin does not need to contain mega doses.
- Keep a written three to five day food diary every four weeks to keep on track with the quantity and variety of food eaten. Seeing the amount of food eaten on paper provides good feedback of dietary habits and could prevent over- or under-eating.
- Listen to the body. If it craves something, chances are that it needs the nutrients in that food.
- When more assistance is needed, locate a registered dietitian who specializes in sports nutrition.

"Don'ts"


- Restrict your eating to a few food groups. This may lead to nutritional deficiencies in the future.
- Consume too much fat after a training session or a race. Because fat is preferentially oxidized over carbo-



hydrates, it can slow the absorption of carbohydrates and can slow the recovery process.

- Take any nutritional supplement that has not been researched in credible scientific journals or whose effects are unknown. Taking a nutritional supplement without knowing its full effects could actually lead to a decrease in performance, termed ergolytic rather than ergogenic. There are not many proven nutritional supplements that produce positive effects for endurance athletes.
- Believe a product or a specific way of eating is the only way to achieve success just because a training partner, friend or family member uses or follows it. Each person and athlete is different. Use the information gained from scientific research combined with trial and error to determine the best option.
- Worry about protein intake. Athletes who eat an adequate amount of food to support training will more than often consume more than enough protein to support training and recovery. Exceptions are true vegans or those who do not consume enough calories.

By combining the above nutrition periodization principles to an already periodized physical training program, the endurance athlete will undoubtedly be able to perform at the highest level of human performance possible for their body.

For more information, contact Bob Seebohar at bob@atpcoaching.com or purchase his new book, "Nutrition Periodization for Endurance Athletes," at www.bullpub.com. 



Enhancing Performance Through Nutrition—

EAT TO COMPETE!



by Jackie Maurer, MS, RD
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Good nutrition isn't just for dieters. What you eat and drink before, during and even after competition plays a critical role in how well you perform and recover. Sound performance nutrition practices should be a part of every athlete's training; however, many athletes don't know what performance nutrition is or even how to "eat to compete" their best. This article will provide the foundation for athletes to build a strong performance nutrition plan, and with practice help them to enhance their performance.

Performance nutrition is comprised of three principles:

1. **Quantity**—how much food and drink you need to consume daily to meet your calorie (energy) needs.
2. **Mix**—the mixture (carbohydrate, protein, fat, fluid) of the food and drink you need daily to provide the right type of calories necessary for your sport.
3. **Timing**—when to eat the quantity and mix of food and drink you need daily to optimize your performance.

QUANTITY—HOW MANY CALORIES DO ATHLETES NEED DAILY?

Before figuring out how many calories an athlete needs daily, it's helpful to know exactly what they are. Calories are the energy content of food. The number of calories, or energy, an athlete needs to maintain their weight depends upon: age, body weight, gender, resting energy expenditure and physical activity levels. Calorie needs are based upon total energy expenditure (TEE), which includes two major parts:

1. **Resting Energy Expenditure (REE):***
the amount of calories needed to keep body systems going and control body temperature at rest.
2. **Activity Energy Expenditure (AEE):***
the amount of calories used during activity.



* Note: In addition to the above two factors, a small percentage of TEE comes from something called, the thermic effect of food (TEF). The TEF represents the energy expenditure that is used to help digest, absorb, transport, metabolize, and store calories (energy) from food and beverage. Since TEF usually accounts for such a minor percentage of TEE (~6%-10%) and the exact amount varies greatly with total calories consumed, type of food consumed, and degree of excess body weight, it is often not included in simple equations for estimating TEE (daily calorie needs).

The number of calories an athlete needs to maintain their body weight can be estimated by multiplying their REE times an appropriate activity factor (AF).

STEP 1. Use one of the formulas in table below to estimate REE.

TABLE 1. Formulas for Estimating Calorie Needs for Resting Energy Expenditure (REE)†	
Formula 1	
Males: REE Calories = 11 x body weight in pounds	
Females: REE Calories = 10 x body weight in pounds	
Formula 2	
Males: REE Calories = 66.47 + 13.75 (weight in kg) + 5 (height in cm) – 6.76 (age, yr)	
Females: REE Calories = 655.1 + 9.65 (weight in kg) + 1.84 (height in cm) – 4.68 (age, yr)	

Key: kg, kilograms (pound/2.2); cm, centimeters (inches x 2.54); yr, years

†Equations are for healthy people

STEP 2. Choose an appropriate AF based on your activity level from Table 2. You may have a different AF for different days on the week, since your activity level may change with training.

TABLE 2. Activity Level	Activity Factor	
	Male	Female
Resting: Sleeping, reclining.	1.0	1.0
Sedentary: Minimal movement, largely sitting or lying down. Activities include: watching television, reading, etc.	1.3	1.3
Light: Office work, sitting, day consists of sleeping 8 hours with 16 hrs of walking or standing. Activities include: walking, laundry, golf, ping pong, walking on level ground at 2.5-3 mph. *Usually includes 1 hour of moderate activity	1.6	1.5
Moderate: Light manual labor. Activities include: walking 3.5-4 mph, carrying a load, cycling, tennis, dancing, weeding and hoeing.	1.7	1.6
Very Active: Full-time athletes, agricultural laborers, active military duty, hard laborers (mine and steel workers). Activities include: walking with a load uphill, team sports, climbing.	2.1	1.9
Extremely Active: Lumberjacks, construction workers, coal miners, some full-time athletes with daily strenuous training.	2.4	2.2

STEP 3. Enter your REE (calculated from table 1). Multiply your REE by the appropriate AF listed in the table 2.

$$\text{Estimated TEE Calories} = \frac{\text{Your REE}}{\text{Your REE}} \times \frac{\text{Your AF}}{\text{Your AF}}$$

To maintain your weight you need _____ calories each day.
Enter your TEE**

** Note: This calculated TEE is an estimation of daily calorie needs to maintain a current body weight. Actual calorie needs may be higher or lower, so this estimation should be used only as a starting point in calculating daily energy needs. Body weight maintenance, loss or gain, will verify if the estimated calorie needs are accurate, suboptimal, or excessive, respectfully.

MIX & TIMING

When and what you eat and drink is critical to a peak performance nutrition plan, and while the amount and type of food and drink will differ from athlete to athlete and sport to sport, there are a few basic tips all athletes can follow. The tables below and to the right are color coordinated (shades of blue) depending upon the type of sport an athlete participates in and correspond to recommendations for timing and mix of food and fluid to consume during training and competition.

TABLE 3. FLUID TIPS FOR TRAINING AND COMPETITION					
	Endurance Sports Long distance running, Swimming, Cycling, Cross country skiing.		Power Sports Football (offensive & defensive lineman), Field events, Weight-lifting, Sprinting (run or swim).	Stop & Go Sports Team sports (Basketball, Volleyball, Soccer, Tennis), Football (other than OL & DL), Boxing, Wrestling.	
2 hours before Exercise	16 ounces (2 cups) of cool fluid.				
15-20 minutes before Exercise	8 to 16 ounces (1 - 2 cups) of cool fluid Weigh yourself to get your pre-exercise weight.				
During Exercise CHO = carbohydrate Note: If exercising on an empty stomach for 1 hour (whether continuous or intermittent) drink a fluid with CHO during the activity.	If exercise < 60 minutes	If exercise > 60 minutes	Sip cool water between competition sets (trials, plays, etc.). Aim for drinking 21/2-6 cups of water each hour.	If exercise < 60 minutes total	If exercise > 60 minutes total
	Drink 6-12 ounces of cool water every 15-20 minutes. Take small sips throughout 15-20 minutes	Drink 6-12 ounces of cool fluid every 15-20 minutes with 4-8% CHO solution, and 0.5-0.7 g of sodium/Liter (Commercial Sports Drinks). Take small sips throughout 15-20 minutes.		Drink 6-12 ounces of cool water every 15-20 minutes. Take small sips throughout 15-20 minutes.	Drink 6-12 ounces of cool fluid every 15-20 minutes with 4-8% CHO solution, and 0.5-0.7 g of sodium/Liter (Commercial Sports Drinks). Take small sips throughout 15-20 minutes.
After Exercise	Weigh yourself to get your post-exercise weight Subtract post-exercise weight from pre-exercise weight = Water weight loss For every pound of water weight loss, drink 3 cups of cool fluid Example: Pre-exercise weight: 145 lbs Post exercise weight: 143 lbs Water weight loss = 2 pounds = 6 cups (48 ounces) of cool fluid				
	<ul style="list-style-type: none"> • Drink cool water with immediate post-exercise meal or snack. • Drink cool sports beverage, or CHO and sodium containing drink, if no immediate post-exercise meal or snack. • Choose a drink with a small amount of protein (4-8 gm) if unable to have a snack with protein with your drink. 		<ul style="list-style-type: none"> • Drink cool water with immediate post-exercise meal or snack. • Choose a drink with a small amount of protein (4-8 gm) if unable to have a snack with protein with your drink, try low-fat chocolate milk. 	<ul style="list-style-type: none"> • Drink cool water with immediate post-exercise meal or snack. • Drink cool sports beverage, or CHO and sodium containing drink, if no immediate post-exercise meal or snack. • Choose a drink with a small amount of protein (4-8 gm) if unable to have a snack with protein with your drink. 	
Throughout the Day	<ul style="list-style-type: none"> • Carry a water bottle with you and drink from it often. • Drink water with all meals. • Look for a pale yellow colored urine to indicate you are hydrated. • Drink before, during, and after exercise. • Eat fluid-rich fruits and vegetables. • Replace sodium lost through sweating after practice /competition by snacking on salty foods and/or drinking a sports beverage with salt. 				


TABLE 4. FOOD TIPS FOR TRAINING AND COMPETITION

	Endurance Sports Long distance running, Swimming, Cycling, Cross country skiing	Power Sports Football (offensive & defensive lineman), Field events, Weight-lifting, Sprinting (run or swim)	Stop & Go Sports Team sports (Basketball, Volleyball, Soccer, Tennis), Football (other than OL & DL), Boxing, Wrestling
1–4 hours before Exercise	Consume 0.5–1.8 g of Carbohydrate (CHO) per lb of Body Weight (BW) in a high-CHO, low-fat, moderate Protein (PRO) snack or meal.		
30–60 minutes before Exercise	Consume 0.3–0.5 g of CHO per lb of BW Choose familiar, low-fat, low-fiber foods.		
During Exercise	If exercise < 60 minutes	If exercise > 60 minutes	If total time spent in exercise in less than 1 hour and the athlete has come into the exercise in a fed state, then no additional CHO, PRO, or fat is needed during exercise.
	Consume 6–12 ounces of cool fluid every 15-20 minutes.	Consume 30–60 grams of CHO in an easily digestible snack or beverage every hour.	
			If exercise > 60 minutes total
			Consume 6–12 ounces of cool fluid every 15-20 minutes.
			Consume 30–60 grams of CHO in an easily digestible snack or beverage every hour.
30 minutes after Exercise	Consume 0.7 g of CHO per lb of BW in a low-fat snack.		Consume 0.7 g of CHO per lb of BW in a low-fat snack.
Within 2 hours after exercise.	Eat a high CHO (0.5-0.7 grams of CHO/lb BW), moderate PRO, and low-fat meal.		
Daily	For exercise lasting 1 to 3 hours daily, consume 2.7–4.5 grams CHO/ lb BW. For exercise lasting 4 or > hours daily, consume 5.4 –5.9 grams CHO/lb BW.		
	Protein Needs††: 0.4–0.7 g/lb BW	Protein Needs††: 0.4–0.8 g/lb BW	Protein Needs††: 0.5–0.7 g/lb BW
Snacks with 30g of CHO	<ul style="list-style-type: none"> • 16 oz Sports Drink • 1 Large Banana • 3 Fig Bars/Cookies • 2 cups of Cheerios® • 6 Graham Crackers Squares • 1 cup 100% Apple Juice • 12 Saltine-like Crackers • 1 Fruit Cereal Bar 		

CHO = carbohydrate, g = grams, lb = pound, BW = body weight, PRO = protein, oz = ounce

†† Note: There are currently no specific guidelines for protein intake before, during, or after exercise. Research does support benefit of a small amount of protein intake along with carbohydrate in pre- and post-exercise meals and snacks. Additionally, daily protein needs are higher in early training and then taper off (choose the higher end of recommended protein needs during early stages of training, then adapt to the lower end of recommended range of protein intake as training progresses).

BOTTOM LINE

Nutrition is often an overlooked aspect of training and one that can help give you that legal, competitive edge, if used wisely. Rome wasn't built in one day, and it's unlikely an athlete will master the principles listed above in that time frame either, but with practice, practice, and then some more practice, any athlete can master the art of "eat to compete." Good luck and happy eating! 





In Search of an Effective Coaching Style

by Wade Gilbert, Ph.D. with
Catherine Jackson, Ph.D.,
FACSM

California State University, Fresno

Despite a tremendous amount of research and literature on coaching, the answer to the most fundamental question remains elusive: What style of coaching is most effective for consistently producing optimal performance? There is no general theory of coaching effectiveness, and given the wide variance of athlete needs between competitive levels and sports, some may argue that it is an impractical endeavor. Surely, however, there are common behaviors, thoughts, and characteristics of effective coaches, regardless of the context.

Successful, or effective, coaches are highly driven, reflective, and develop a coaching style that is consistent with their unique personality. In essence, reflecting on who you are (personality) and your perceived role as a coach (role frame) leads to the development of a genuine coaching style that takes advantage of your unique personal strengths.

In the remainder of this article we summarize a model of coach reflection and highlight a new way to measure coaching effectiveness - in other words, how do you know if your coaching style is effective?

THE ROLE OF REFLECTION IN DEVELOPING AN EFFECTIVE COACHING STYLE

A characteristic of effective coaches at all levels is continued ongoing learning and reflection. For great coaches there never is an "off-season." I remember speaking with the legendary John Wooden about how he developed his effective coaching style. He reported that at the end of each competitive season, when most athletes and coaches would break for the off-season, he would embark on a course of intensive self-study. He would select one aspect of coaching or basketball where he wanted to become

more knowledgeable and learn everything he could about that topic by reading anything he could find and speaking with other coaches and professionals. This intensive self-study was initiated by continued reflection on his coaching strengths and weaknesses.

Virtually every portrait of great coaches shows them to be active learners who engage in constant reflection. Reflection is somewhat of an educational buzzword that is used liberally and seldom defined. What is reflection? What does the reflective process look like? Can you teach someone how to be more reflective? What resources are most valuable for coach reflection? When is reflection triggered, and why? These are the types of questions that my colleague Pierre Trudel and I addressed recently in a study that resulted in an empirical model of coach reflection.

Reflection is a process that mediates experience and knowledge, and is at the heart of all experienced-based learning theories. Reflection is generally triggered by professional dilemmas (referred to as issues or problems). Central to defining reflection is the concept of a reflective conversation. A reflective conversation is defined as a repeating spiral of appreciation (problem setting), action (experimenting), and re-appreciation (problem setting).

Our research found evidence for at least three types of reflection with model coaches: reflection-in-action, reflection-on-action, and retrospective reflection-on-action. Reflection-in-action is critical thought about an issue that occurs in the midst of activity. Reflection that occurs within a time-frame in which the issue can still be addressed, but not in the midst of activity, is defined as reflection-on-action (e.g., the coach who reflects about an issue in-between competitions or training sessions). Retrospective reflection-on-action is defined as reflection that occurs outside of the action-present (e.g., after the season or after a coach's reflection can no longer impact the situation). Retrospective reflection-on-action is genuinely a 'thinking back' type of reflection because there is no longer an opportunity to address the issue.

Other important findings show that a reflective conversation includes four stages: issue setting, strategy generation, experimentation, and evaluation. These four stages are directly influenced by the way a coach perceives his or her role as a coach, referred to as their role frame. A coach's role frame is, in essence, a window to their coaching style. It may be inferred then that a coach's style not only directly influences coach-athlete interpersonal relationships and the coaching process, but the very process of learning how to coach (i.e., developing coaching strategies). How can we use this information to nurture reflection and the development of an effective coaching style?

Role frame analysis is suggested as a method for coaches to review and analyze their role frames. Coaches are typically unaware of how they frame their role because role frames are tacit (implied) and difficult to verbalize (simi-

lar to a belief system). The objective of a role frame analysis activity is to create awareness of implicit values that guide practice. Dr. Trudel and I recently summarized role frame analysis in another article:

“...role frames can surface by interrupting practitioners while they are in the process of addressing a challenging issue. Similarly, coaches could be asked, individually and in small groups, to address a series of typical coaching issues. While engaged in the process of thinking about how to resolve the issue, coaches could be asked to respond to questions such as ‘Why is this considered to be an issue?’ and ‘What strategies could be used to address the issue?’ Another alternative, and perhaps more effective, would be to have coaches reflect on coaching issues they had just recently experienced or were presently experiencing. In either case, coaches could then be asked to create a visual display of their approach to coaching (role frame diagram). For the final step in the exercise, time would be allotted to allow the coaches to critically evaluate their role frame diagrams.”


MEASURING EFFECTIVE COACHING

Historically, coaching science has relied on behavioral assessments to record and evaluate coach effectiveness. A behavioral approach, using systematic observation tools, provides a detailed record of a coach’s overt behaviors, but there are many practical limitations of this approach. For example, extensive observer training is often required and many observations are needed to obtain valid and reliable results. Another common way to assess coach effectiveness is the use of questionnaires, the most common being the Leadership Scale for Sports (LSS). The LSS includes three questionnaires that provide data on athlete and coach perceptions of actual and preferred leadership style. Leadership style is separated into five dimensions: training and instructional behavior, democratic behavior, autocratic behavior, social support behavior, and rewarding behavior. Although widely used for many years in coaching research, the validity of the LSS has been questioned, particularly as a tool for assessing all aspects of effective coaching.

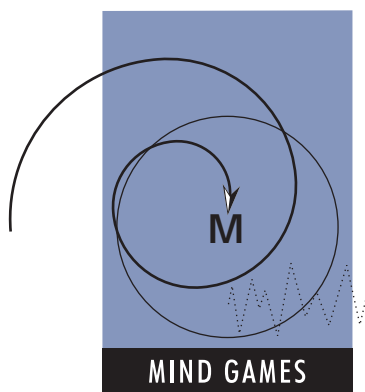
Recent developments in coach assessment show promise for providing a broader evaluation of coaching effectiveness. First, a comprehensive line of research has resulted in the creation of The Coaching Behavior Scale for Sport (CBS-S). This pen and paper evaluation allows athletes to assess a coach’s effectiveness along seven dimensions of coaching: technical skills, competition strategies, personal rapport, physical training and planning, mental preparation, goal setting, and negative personal rapport. This method has been tested with a wide range of athletes and has been shown to be a valid and reliable measure of effective coaching. However, as with other questionnaires designed to measure coaching styles, effective coaching is based on athlete perceptions and subjective evaluations of their coach.

In an effort to address the limitations of relying on a single method for making judgments on coach effectiveness, a multidimensional performance appraisal model was recently proposed by Cunningham and Dixon. This new model includes objective and subjective methods for measuring coach effectiveness along six dimensions of coaching performance: athletic outcomes, academic outcomes, ethical behavior, fiscal responsibility, recruit quality, and athlete satisfaction. Although proposed specifically for intercollegiate sport, the model provides a framework for evaluating coach effectiveness in any context.

Clearly, much remains to be known about effective coaching styles. As a scientific enterprise, we have truly only begun to scratch the surface. It is often argued that effective coaching is as much an art as it is a science. The goal of coaching research on this topic is to better understand this artistry and how to facilitate the development of an effective coaching style.

Here in the sport psychology program at Fresno State, we are in the process of designing a project to address these goals. Recent research on positive psychology and optimism provides innovative methodologies for designing coach effectiveness research. It has been shown that one’s explanatory style can be mapped using a technique referred to as Content Analysis of Verbatim Explanations (CAVE). Based on limited research with successful college and professional coaches, Seligman and colleagues found that effective coaches have an optimistic explanatory style. More importantly, an optimistic explanatory style can be learned even though it is often considered a stable personality trait. This raises but another question—is an effective coaching style a personality trait or a learned behavioral characteristic? Many exciting developments from the fields of coaching science and sport psychology will surely provide additional insight into effective coaching styles in the next decade. 





How Coaches Can Talk to Their Female Athletes About Nutrition and Weight Control

by Sean McCann, Ph.D.

Head of Sport Psychology at the United States

Olympic Committee

"I try to be sensitive, but it is like walking on eggshells. I know better than to compare athletes in terms of skinniness, but what am I supposed to do if I really believe an athlete needs to lose weight to get better? I feel it is my responsibility to say something, but I'm afraid I will say the wrong thing."

—National Team Coach.

"I saw the video on athletes with eating disorders, and I saw the part where the athlete pretty much blamed her coach for developing an eating disorder, because the coach told her she could be faster if she lost some weight. The whole time I was thinking, 'I've told lots of athletes the same thing.'"

—Endurance Sport Coach

THE INTERPLAY OF NUTRITION, EATING BEHAVIORS, AND EMOTIONS

As this special issue indicates, nutrition is one of the last legal frontiers for performance enhancement. Sport scientists know more about the relationship between eating, drinking, and performance than ever before. However, even as the science and knowledge of sports nutrition improves, the reality is that for most people in society, thinking about eating patterns and weight management are topics that produce emotional rather than rational responses. The world of sport is no exception, and in fact, the environment of

sport can create special emotional challenges that make discussion of eating behaviors and nutrition a loaded issue for coaches and athletes.

Many coaches who have tried to push the performance envelope by focusing on nutrition, body fat, and weight of their athletes find that they have wandered, unintentionally, into an emotional minefield. What may have begun as a search for a performance edge can evolve into something altogether different. The reality is this; for most athletes, discussions of weight gain, weight loss, decreasing body fat, the performance impact of leanness, percentages of carbohydrates in a diet, and other sports nutrition topics are subjects that come at times with a great deal of emotional baggage. This is especially true for female athletes.

THE WORLD OF YOUNG WOMEN

To understand young female athletes, you need to appreciate the special challenges of being a young woman in today's world. These issues are discussed well and fully in other areas (an excellent but sobering read for any coach of young women, is "Reviving Ophelia"), but a partial list of the challenges for young women today include:

Life has sped up. Everything arrives earlier including puberty and exposure to adult topics. Italian researchers recently found evidence to suggest that increased television watching impacting melatonin levels, contributing to the earlier onset of puberty today. Whatever the cause, earlier onset of puberty is well established in the literature. In addition to the physiological realities of adolescence, children today are being forced earlier to deal with the psychological impact of discussions of and direct exposure to sexuality, in movies, television, and in the schools. "Hooking up" with classmates is happening earlier and earlier.

Body image pressures are increasing—clothes and culture. Ask any parent of a girl today, and they will tell you that trying to buy pants that aren't cut low, shirts that aren't cut above the bellybutton, and anything that isn't skin tight, is getting harder and harder. The horrible question for high schoolers; "Do I look fat?" is now being asked by 8 and 9-year olds! A study of 6th graders found that 70% of them first became concerned about their weight between ages 9 and 11. An athletic but larger-framed adolescent girl trying to squeeze into today's fashions can feel awkward, exposed, and can be acutely sensitive to comments about her body, even well-meaning comments from family or friends (or coaches!).

"Ideal body" stereotypes are more distorted than ever. Ironically, even as childhood and adolescent obesity grows as a major problem in the U.S., the body ideal gets skinnier and skinnier. A study of Playboy magazine centerfolds has found that the breast size of the models has stayed the same or increased since the 60's, but that the waist size has gotten smaller and smaller. Plastic surgery has had this impact on the models



in women's magazines as well. In other words, our society's definitions of beauty are becoming more and more unrealistic, and more and more unobtainable for young women who care greatly about how attractive they are.

Discussions of diets are everywhere, while discussions of health are absent.

Ask most teenage girls about the body's energy systems, and you will draw a blank. Ask them about what is "bad to eat," however, and they will provide you with a long list, including virtually all carbohydrates and fat! Teenage girls are exposed constantly to diet discussions, including partial truths, misinformation, and advertising endorsements from famous actresses. Go online and you will find websites that actually endorse eating disorders and "teach" girls how to become more "successful" at them! Misinformation like this produces some bizarre beliefs about eating, health, and food. For example, many young female athletes do not understand that there is a minimum necessary amount of body fat for health. If it is body fat, they reason, it is bad, and is the enemy. For many young female athletes, a coach who measures "body fat" is opening up a Pandora's Box of buried fears, self-doubt, and dangerous thinking.

EATING DISORDERS

The rates of childhood and adolescent obesity are growing in the U.S. On the other end of the spectrum, however, rates of adolescent eating disorders have grown over the last 30 years, and almost every teenager knows someone with an eating disorder. The problem may be even more pronounced in sports. Studies in the last two years have found eating disorders and disordered eating (problematic behaviors that don't meet the strict criteria for eating disorder) in college-age athletes to be evident in over 50% of participants in some sports. Helping female athletes stay healthy and avoid the "Female Athlete Triad" (amenorrhea, eating disorder, and low bone density) is a major performance factor for coaches of endurance sports, sports that emphasize leanness (including judged sports), and weight category sports. Many elite coaches have lost extremely talented athletes as they developed eating disorders, and gradually lost the ability to tolerate training loads, resulting in season and career ending injuries.

PERFECTIONISM, AND DIETS—AN UNHEALTHY MIX

Perfectionism has both healthy and unhealthy components. On one hand, it helps generate high standards and a strong work ethic, on the other; it can cause people to worry too much about making mistakes, and strive towards unrealistic ideals.

The number one trigger for eating disorders in adolescents is going on a diet. One of the most useful but difficult personality traits for athletes is perfectionism. Control of weight by means of a diet can trigger a variety of destructive thinking for perfectionists. One frequently occurring thought for perfectionistic athletes is a search for things they can control. Controlling what they eat may be easier than developing a difficult technical sport skill. While only a very small percentage of people who go on diets end up developing an eating disorder, a coach needs to consider with the characteristics of the athlete he or she is working with when broaching the topic of restricting diet.

If you have a driven, perfectionistic young female athlete, and you suggest that they need to lose weight, you may unintentionally set off a series of unhealthy behaviors. Many may attempt to skip meals, for example, which research shows can induce the body to hold on to body fat. The athlete who tries to avoid eating all day may be also be pre-disposing themselves to bingeing when they do eat. At the Olympic Training Center, I have seen a number of other athlete responses to non-specific advice to lose weight, including; using "recovery time" to do more aerobic exercise, eliminating fat from diets, diet pills, using saunas to sweat off weight, vomiting, and "fruit and veggie only" days. Usually, these responses are secretive, and the coach has no idea what the athlete is up to. In any case, discussions of weight loss with young female athletes should always be thought through carefully, with plenty of professional guidance on healthy eating strategies.

INDIVIDUAL DIFFERENCES

Many athletes associate fitness with skinniness. Many athletes will compare weights, without considering body type, sport demands, or even height! Unfortunately, many coaches are also guilty of ignoring individual differences when they talk about body weight. Frequently, coaches assume that a more muscular endurance athlete would perform better with less bulk. What if the athlete in question has exactly the right mix of muscle mass to body mass for them to tolerate training loads, recover quickly, and perform at their personal peak? This point was driven home for me at the Athens Olympics where I saw a much more powerfully built mountain biker pass leaner and lighter riders while climbing into a very high finish at the Olympics. Could she have done even better if lighter? Or would she even have made her Olympic team?

In your sport, how many times have you seen great athletes defy the stereotypical assumptions about ideal body type

needed for greatness? If this is true at the very elite level, why would coaches of young developing athletes ignore individual differences and try to remake an athlete's body? It is an easy and dangerous trap to fall into.


YOUNG MEN AND YOUNG WOMEN

This article has focused primarily on young women, in part because research shows that women are more likely to develop self-destructive eating habits and full-fledged eating disorders than men. This doesn't mean, however, that many young male athletes don't have similar issues. For example, in a sport such as ski jumping, where leanness is a performance advantage, the international federation had to develop minimum body mass standards to deal with a rash of eating disorders among the males competing internationally. Wrestling, another weight control sport, has had several male athlete fatalities from unhealthy, severe weight-cutting practices. From my perspective as a sport psychologist for elite men and women, however, I have simply seen many more women respond to nutritional issues in ways that hurt themselves and that surprised and confounded their coaches.

DO'S AND DON'T'S WHEN TALKING ABOUT NUTRITION

"When I actually had women crying in a team meeting, I realized putting everybody's body fat on one sheet and passing it out was not the brightest idea I ever had."

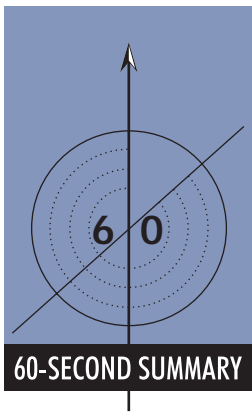
—National Team Coach

1. Don't talk about weight loss, body fat, or diets, without first thinking through why you are doing it and what you hope to achieve.
2. Don't wade into these waters without a strong multi-disciplinary team to support you. Such a team should include a nutritionist, psychologist, and physiologist.
3. Don't assume that athletes will treat discussions of fat in a rational, unemotional way.
4. Don't treat weight loss and gain as a matter of personal character ("If you had some discipline, weight wouldn't be an issue!")
5. Don't verbally jump on athletes every time you see them eating poorly. ("You'll never be any good if you keep on eating hot dogs.")
6. Do consider the potential costs along with the benefits of doing body composition tests or regular weigh-ins. Some coaches have decided that the potential down-side outweighs the benefits for developing athletes.
7. Do provide lots of good information about healthy eating, nutrition, energy systems, and strategies for maximizing performance through nutrition.
8. Don't do group weigh-ins, or discuss individual body composition results in a group.
9. Do expect athletes to have some strange, uninformed ideas about food.
10. Do expect "if a little is good, a lot is better" thinking to be rumbling around in athletes' heads when you make nutrition recommendations. This can mean "reduced fat" is interpreted to be "NO FAT," and "less than 1500 calories" is interpreted to mean "less than 500 calories if I am really good".
11. Do be watchful with athletes held out of training for some time due to injury. In the weeks they are out, they may be developing guilt about not burning off calories, or they may develop unrealistic weight goals based on loss of muscle mass secondary to injury. One elite gymnast I worked with developed an eating disorder during the recovery period from an ACL tear. As her weight dropped from constant riding on the exercise bike, she grew resistant to the idea of getting back to her pre-injured weight, and she resented her increasing muscle mass as she came back to her sport.
12. Do expect your athletes to be significantly influenced by people without sophisticated understanding of nutrition. I have seen national team athletes torn up by comments from parents, boyfriends, and teammates. One woman successfully eroded a teammate's confidence simply by asking "is it those pants, or is your butt a lot bigger these days?" It took that athlete six months to realize that her teammate just wanted her spot on the team.
13. Do get everyone on your nutrition team on the same page. Discuss your goals for the team and individual athletes, and make sure everybody agrees, before talking to athletes about any individual goals.
14. Do prohibit certain kinds of language when talking about weight. "Jokes," nicknames, sarcasm, and insults should never be allowed when talking about weight loss or gain.
15. Be knowledgeable about who you might refer an athlete to if you suspect he or she is developing an eating disorder. 

ADDITIONAL READING

Pipher, Mary. *Reviving Ophelia: Saving the Selves of Adolescent Girls*. Ballantine Books, 1995 ISBN: 0345392825

Thompson, Ron A. and Roberta Trattner Sherman. *Helping Athletes with Eating Disorders*. Champaign, IL: Human Kinetics, 1993. ISBN: 0873223837



Fluid and Carbohydrate Intake During Team Games: Research and Recommendations

by Louise Burke, Ph.D.

Sportscience 3(1) sportsci.org/jour/99901/lmb.html

(accessed 10/13/04)

REVIEW


The multitude of factors (position, level of competition, psychological effect, etc.) in team sports makes research very difficult. It is very difficult to simulate competitive situations in a lab for measurement. “The major limitation of such studies is in the validity of the performance measure: how well do changes in an isolated physical or cognitive task translate into on-field performance?” (Burke, 1999) Researchers try to overcome the limitations by three methods: “performance test that mimic physical demands,” simulating conditions in a lab and real competitions. Real competitions are



more valid, but it becomes almost impossible to duplicate effort, so the reliability of such studies becomes suspect. “Every match in a sport is a unique situation: there is no standard workload even for the same player. (Burke, 1999)”

With regards to team sports and the intakes of fluids and carbohydrates, “our impression (Burke and Hawley) is that fluid intake generally falls behind sweat loss during team games, and that moderate to severe dehydration can occur. We also noted that data on the use of carbohydrate-containing drinks to promote fuel replacement during matches are not available. Fuel requirements vary between team sports: tournament play in particular must pose the greatest challenge to the fuel status of players, especially when the match schedule does not allow enough time for restoration of muscle glycogen between games” (Burke, 1999).

Due to the lack of good scientific data, Burke makes the following recommendations based on her background and insights into sport:

1. “Players should track sweat losses in different environments by weighing themselves regularly before and after training sessions. Use the data to identify individuals at risk of dehydration and to implement a team fluid-intake plan.
2. Players must begin each match properly hydrated. Fluid losses from previous matches or training need to be restored. It is also useful to drink immediately before a game. Players can learn to tolerate up to 5 ml per kg during the warm-up.
3. Players should consume fluid every 10-15 minutes.
4. Players drink more pleasant-tasting sports drinks than plain water. Sports drinks have the extra advantage of providing energy in situations where liver and muscle glycogen stores are likely to be depleted.
5. Post-match re-hydration is an important part of recovery. Use drinks containing substantial amounts of carbohydrate and salts. Avoid excessive intake of alcohol. 



USOC DIRECTORY FOR THE COACHING RESOURCES STAFF

HOT OFF THE PRESS

WEBSITES FOR NUTRITIONAL INFORMATION

AUSTRALIAN INSTITUTE OF SPORTS

Nutrition Section—This is a great resource for coaches and athletes. The website contains fact sheets on hot topics such as tournaments and multiple heat competitions, vegetarian eating and zone diets, just to mention a few.
[_http://www.ais.org.au/nutrition/index.asp](http://www.ais.org.au/nutrition/index.asp)

THE UNIVERSITY OF ARIZONA

<http://ag.arizona.edu/NSC/new/hept/index.htm>

SPORT SCIENCE

<http://www.sportsci.org/index.html?jour/03/03.htm&1>

MARTINDALE CALCULATOR'S VARIOUS NUTRITIONAL CALCULATORS

http://www.martindalecenter.com/Calculators1B_4_Nut.html

GATORADE SPORT SCIENCE INSTITUTE QUALITY NUTRITION EDUCATION HANDOUTS

<http://www.gssiweb.com/sportssciencecenter/topic.cfm?id=61>

COACHING ASSOCIATION OF CANADA

<http://www.coach.ca/e/nutrition/resources.htm>

OLYMPIC COACH E-MAGAZINE

The U.S. Olympic Committee Coaching and Sport Sciences Division reminds you that our quarterly magazine, OLYMPIC COACH, is now available electronically as the OLYMPIC COACH E-MAGAZINE.

This quarterly publication designed for coaches at all levels can now come to you via e-mail. The quarterly e-mail provides a summary of each article in the magazine with a link that takes you directly to the full-length article. The E-magazine contains the same content as the print version of the magazine. The best news is that OLYMPIC COACH E-MAGAZINE is available to all coaches and other interested individuals free of charge. To receive your complimentary subscription, go to the web site at <http://coaching.usolympicteam.com/coaching/ksub.nsf>, and sign up. The subscription information that you provide will not be shared or sold to any other organization or corporation. Please share this opportunity with other individuals in the coaching community. The PDF version of past editions of the Olympic Coach magazine are available at: <http://coaching.usolympicteam.com/coaching/kpub.nsf>

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USA
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Rings



PAUL FOERSTER **and** KEVIN BURNHAM

On August 21, 2004 Paul Foerster and Kevin Burnham of Team USA bring home the gold medal in the men's double handed dinghy 470 finals race during the Athens 2004 Summer Olympic Games at Agios Kosmas Olympic Sailing Centre in Athens, Greece. (PHOTO BY BEN RADFORD/GETTY IMAGES)



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