Nutrition SENSE

UNIVERSITY OF MASSACHUSETTS – DINING SERVICES

MAY/JUNE 2011

We're on the web:
www.umassdining.com

THIS MONTH'S *quick tip*

Looking for an easy, refreshing, and healthy way to refuel and rehydrate after exercise?

Try a smoothie made with
1 cup yogurt
1/2 cup low fat milk
1/2 cup orange juice
1 tablespoon honey
(or other sweetener)
and a handful of
ice cubes.

Blend and enjoy!

Dianne Z. Sutherland RD, LDN
Dining Services
Worcester Dining Commons – 3rd Floor
110 Stockbridge Road
University of Massachusetts
Amherst, MA 01003

Phone (413) 545-2472
Fax (413) 545-9673
Email dietitian@mail.aux.umass.edu

Be Smart. Eat Smart. Live Smart.
Nutrition
UMASS AMHERST DINING SERVICES

Nutrients are life-sustaining substances obtained from food.

Sports Nutrition *for Athletes*

What are nutrients?

Nutrients are life-sustaining substances obtained from food. They work together to supply the body with energy (or calories) – to build muscle, perform and maintain health.

How does nutrition affect my performance?

Not getting enough of the nutrients that your body needs over a period of time can harm your health and hinder your performance. The effects won't be felt overnight, but eating right means that you will feel better, be able to train harder, and be in better condition for optimal performance.

What are the nutrients that I should focus on getting?

CARBOHYDRATES

- Carbohydrates supply the body with energy in the form of calories.
- The body's main source of energy, especially during short-term, high intensity exercise. Carbohydrates are easily digested and absorbed very quickly, thus decreasing the possibility of nausea and indigestion during competition.
- The body stores carbohydrates as glycogen in the liver and muscles – but only enough for 2-3 hours of prolonged exercise. Fatigue and decreased performance will result once glycogen stores are depleted.
- In general, athletes require more carbohydrates than recreational exercisers and nonexercisers to continually fuel and refuel muscles and supply a steady stream of energy to the brain (see chart below).
- Without enough carbohydrate, an athlete's muscles and brain will run out of fuel, resulting in poor performance both mentally and physically. Plus, in the absence of carbohydrate, the body will revert to burning protein (from muscles) for energy–talk about a no win.
- It is important for athletes to consume a variety of carbohydrates each day, as some (like candies and fruit juice) are broken down more quickly than others (like whole grains).
- Sources: breads, pasta, rice, oatmeal, dried beans and peas, potatoes, fruit and fruit juice, sports drinks, pretzels, crackers, sweets and syrups.

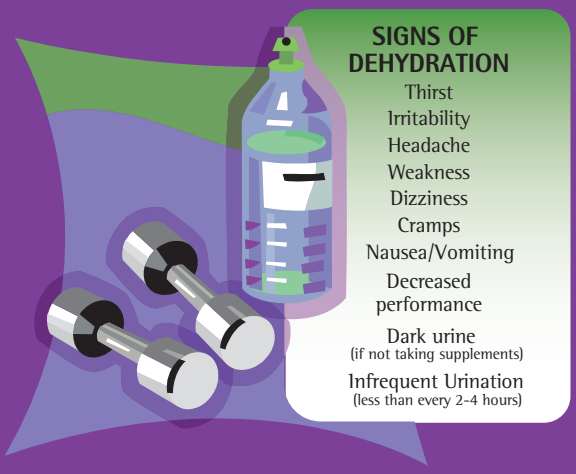
PROTEIN

- Protein supplies the body with energy in the form of calories.
- Needed for growth and repair of body tissues and muscles and to support a healthy immune system.
- Athletes have higher protein needs than non-athletes, but these needs depend on the athlete's weight and the type of exercise he or she is involved with (see chart below).
- To ensure optimal muscle performance and recovery, include a source of protein with every meal, but don't overdue it. The body can only absorb up to 40 grams of protein at one time,

RECOMMENDED DAILY AMOUNTS OF CARBOHYDRATE AND PROTEIN FOR ATHLETES

Carbohydrate	5-7 g/kg/day:	athletes engaging in moderate-intensity exercise for 60-90 minutes per day
	7-12 g/kg/day:	athletes engaging in moderate- to high-intensity endurance exercise for 1-3 hours
	10-12 g/kg/day:	athletes participating in extreme endurance exercise for 4-6 hours per day
Protein	1.2-1.4 g/kg/day:	endurance athletes
	1.2-1.7 g/kg/day:	strength athletes

**Note: to calculate your weight in kilograms (kg) divide your weight in pounds by 2.2*



Sweat

Sweating is the natural process your body uses to give off the heat it generates during exercise. Athletes need to drink adequate amounts of fluids to replace those lost from sweating.

What factors affect sweat?

- Hot, humid weather will prevent sweat from evaporating off of the skin, causing heat to build up in the body and reducing the cooling benefit of sweat. To prevent problems caused by heat and humidity, athletes should exercise at the coolest time of the day and wear the lightest clothing and equipment possible.
- Athletes need to keep the body warm in cold weather but they also need to allow the body to sweat. Dress in several layers of loose clothing to trap the warmth from your body but allow the sweat to be absorbed by the clothing. As you warm up, remove layers to avoid overheating.

Can heat and dehydration affect an athlete's performance?

- Excess heat (due to hot, humid weather or improper body cooling) can result in dehydration, heat cramps, head exhaustion and the most serious form of heat illness – heat stroke. On the field, it can lead to decreased speed, endurance, and mental performance.
- For every 1% loss in body weight, speed decreases by 2% and heart rate increases by 3-5 beats per minute. A 150-pound runner who loses just 3 pounds of fluid (2% of his body weight) will slow down by 4%. That means his 6-minute mile split is now a 6:15, adding almost a minute to his 5K time. His heart rate has also climbed 6-10 beats per minute, meaning he's going to tire out more quickly.
- Remember to always replace fluid lost as sweat during exercise to prevent these and other medical problems. Don't let too little fluid get the best of you and ruin your chances of peak performance!

FLUID NEEDS BEFORE, DURING AND AFTER EXERCISE:

Before Exercise:

Goal: begin exercise hydrated.

Recommendation: If you've been drinking normally and 8-12 hours have passed since your last workout, you're probably adequately hydrated. If not, slowly drink about 1 ½ -2 cups fluid 4 hours before exercise. If you're still not hydrated (urine is dark and/or infrequent), slowly drink another ¾ to 1 ½ cups fluid 2 hours before exercise.

During Exercise:

Goal: prevent dehydration.

Recommendation: Drink 4-12 ounces (½-1 ½ cups) fluid every 15 minutes.

After Exercise:

Goal: replace fluid lost during exercise.

Recommendation: Drink 20-24 ounces (2 ½ - 3 cups) fluid for every pound lost during exercise.

continued from cover

and too much protein before exercise may lead to sluggishness, fatigue, and decreased performance.

- Sources: lean meats, poultry, fish, eggs, dried beans and peas, dairy products, tofu and other soy products, nuts and nut butters, seeds, and whole grains.

FAT

- Fat supplies the body with energy in the form of calories.
- A concentrated energy source for the body that provides twice as much energy as carbohydrates and protein.
- Fat is needed for growth and maintenance of body tissues and functions, to supply essential fatty acids (which must be obtained from foods), and to carry vitamins A, D, E, and K into the body.
- An athlete's diet should contain about 25-30% fat. Focus on healthy fats like olive and canola oils, avocados, and nuts, and less on saturated fats (butter, meats) and trans fats (hydrogenated oils found in processed cookies and crackers, baked goods and margarine)
- Because fat empties from the stomach slowly, it may cause nausea, indigestion, and sluggishness if consumed just before a game.
- Sources: oils, avocados, nuts, seeds, cheese, meat, butter, and margarine.

VITAMINS & MINERALS:

- Vitamins and minerals are needed by the body in order to release the energy found in carbohydrates, protein and fat. They do not contain calories.
- Minerals give the body structure and control many body processes.
- Minerals needed by the body include iron, calcium, zinc, potassium and magnesium.
- Iron helps supply oxygen to the muscles during exercise. Iron needs may be higher for athletes, especially those engaging in endurance sports like distance running.
- Low iron levels can cause fatigue and decrease endurance. For females, iron is lost during menstruation and needs to be replaced by iron-rich foods (meat, green leafy vegetables, fortified cereals/grains, beans). Foods rich in vitamin C like citrus fruits enhance iron absorption when they are eaten together.
- Vitamins and minerals are supplied by eating a wide variety of foods from all food groups. Since most athletes must consume a large number of calories to meet carbohydrate and protein needs, it is very easy to obtain adequate amounts of vitamins and minerals from food.

Should athletes take vitamin supplements?

- Vitamin deficiencies can impair performance. However, there is no evidence that vitamins

taken in excess of normal daily allowances will enhance performance. In fact, some vitamins, especially the fat-soluble ones (A, D, E, K) may be harmful if consumed in greater than normal amounts.

- Athletes who do not eat adequate diets, along with those who are vegetarian/vegan, live in Northern climates, and/or restrict foods from certain food groups may require specific vitamin/mineral supplements.
- If you want to take a supplement, opt for a multivitamin that does not contain more than 100% of the RDA for each nutrient. Excess of certain vitamins may turn urine a darker yellow, so don't be alarmed if this happens - it does not mean you are dehydrated.
- A Registered Dietitian and/or physician can help you identify whether or not you need supplements.

WATER

- Water is needed to help the body produce energy. During exercise, one of its major functions is to regulate body temperature.
- Water is the nutrient most often neglected by athletes.
- Inadequate water/fluid intake causes dehydration, which impairs athletic performance and increases the risk of heat illnesses.
- Athletes are encouraged to consume fluids regularly: before, during, and after exercise
- During exercise, thirst is an unreliable indicator of hydration status, so stay on top of your hydration and drink before you get thirsty! Refer to chart on *"Fluid Needs Before, During and After Exercise"* on Page 2
- Every athlete is different, so get to know your sweat rate and drink accordingly. Athletes typically need more fluid when exercising in the heat, for long periods of time, at high intensities, or when wearing a lot of equipment (football, hockey). Weigh yourself before and after a regular workout in dry clothes. For every pound of water weight lost during exercise, replace it with 2½ -3 cups of fluid. If you've lost more than 2% body weight (3 lbs for a 150 lb athlete), try to drink more during exercise. If you've gained weight, drink a little less.

What types of fluids should one drink to replace body fluids?

- If exercising for less than one hour, water should be adequate to meet needs.
- If exercising for greater than one hour, or with high sweat losses (as with exercise in the heat), sports drinks like Gatorade are appropriate. These beverages should contain about 6-8% carbohydrates. If using fruit juice or other sweetened beverages dilute them by at least half and be aware of how you feel. Some athletes experience gastrointestinal distress when consuming fruit juice around exercise.

Bulking Up, Not Out

Wondering how to increase muscle mass without gaining a lot of extra flab? You may have a lot of questions about how to do this appropriately. Should you eat a high protein diet? Buy protein powders and other commercial products? Spend countless hours at the gym? Check out the following tips to help you reach your fitness goals without compromising your physique:

Add resistance exercise.

When overloaded, muscle fibers respond by growing bigger. Just be sure to give muscles time to recover from each lifting session – in general, about 48 hours. Try focusing on a few muscle groups per day if you're going to lift everyday, or opt for a full-body workout every other day.

Increase calories.

To gain 1 pound of body weight in a week, you need to eat an extra 300-500 calories per day. To do this, try adding in an extra meal (think 2nd lunch or 2nd dinner), add something small to the meals you already eat, or eat a few small snacks throughout the day in addition to regular meals. But remember, extra calories alone will not produce bulging biceps – calories plus strength training is the winning combination.

Up the carbs, not the protein.

You don't need to eat a high protein diet to bulk up – adequate amounts will do. To fuel your muscles for intense muscle-building exercise, eat extra carbohydrates like whole grains, beans, fruit, and juice.

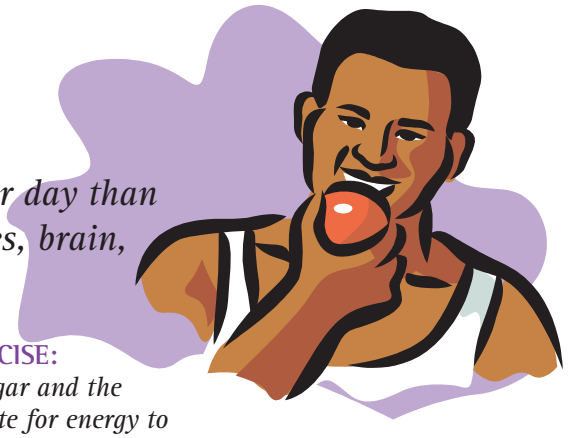
Eat consistently.

Try to eat at least every 4 hours. If you go for long periods of time without eating, your body will break down muscles for fuel. So, put snacks in your gym bag for the road, stock your room with go-to foods, and plan meals in advance to make sure your body is well fueled.

Not gaining weight like you think you should? What's going on?

- Perhaps you inherited a naturally slim physique. Take a look at other members of your family – maybe you just have a slimmer body type than the one you're trying to achieve. If this is the case, work on improving your athletic skills and doing the most with the body you have.
- It might not be the right time yet. If you're still growing in your 20s, which is fairly common, especially in males, your turn to bulk up may not have arrived yet. In this case, it is important to be patient until your body is ready. Force feeding yourself at this stage can upset the body's natural ability to regulate appetite.

Nutrition Before, During And After An Event



To maintain weight, athletes need more calories per day than non-athletes. Think of food as the fuel your muscles, brain, and body need to perform at their best.

FUELING BEFORE EXERCISE:

Goal: to maximize glycogen stores (to fuel muscles) and maintain blood sugar (to fuel the brain). Good pre-exercise fueling can prevent your blood sugar from dropping and settle your stomach by absorbing stomach acid and delaying hunger.

Recommendations:

- Eat foods that you know will settle comfortably, especially when on the road. New foods may not be well tolerated and may result in stomach discomfort, bloating, diarrhea and cramps.
- Leave enough time to digest whatever you decide to eat: 3-4 hours for a large meal, 2-3 hours for a small meal, 1-2 hours for a blended/liquid meal, or less than1 hour for a small snack.
- Avoid foods high in fat (pizza, meat, fast food) as well as foods high in fiber (high-fiber cereals, large portions of whole grains, beans) – they may not settle well and take a long time to empty from the stomach. Consuming simple carbohydrates like sugar, honey, candy or soda before exercise may cause bloating, cramps, and diarrhea and affect performance, so choose your preexercise foods wisely!
- Opt for carbohydrate-rich foods and a little protein. Things like yogurt, bananas, pretzels, pasta, toast with peanut butter, skim milk, oatmeal, bagels and granola bars work well for most athletes.
- Just how much carbohydrate should you eat? That depends on how much time you have before exercise. Athletes can eat 1 gram carbohydrate per kilogram body weight (your weight in pounds divided by 2.2) 1 hour before exercise, 2g/kg 2 hours before, 3g/kg 3 hours before, up to 4-4 ½ g/kg 4 hours before exercise. Check nutrition labels to see how many grams of carbohydrate your pre-exercise foods have and adjust accordingly. And remember, grams listed are for 1 serving!

FUELING DURING EXERCISE:

Goal: maintain blood sugar and the body's use of carbohydrate for energy to maximize performance.

Recommendations:

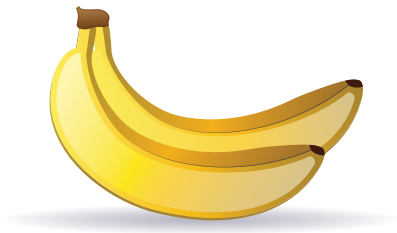
- When exercising longer than 1 hour, athletes need to consume calories to sustain performance.
- Athletes should aim to consume 30-60 grams of carbohydrate per hour after the first hour of exercise. For longer events (> 2 ½ hours), aim for 60-90 grams per hour of a variety of different types of carbohydrate.
- Common choices during exercise include sports drinks, dried pineapple, gels, gummy bears, fresh orange slices, pretzels, Fig Newtons, and energy bars. Experiment during practice to see what works best for you.

REFUELING AFTER EXERCISE:

Goal: restore muscle and liver glycogen to prime the body for the next workout.

Recommendations:

- Try to refuel within 45 minutes of exercise for maximum benefit.
- Choose mostly carbohydrates plus a little protein to refuel and repair muscles, decrease muscle soreness, and speed recovery. It is important to make sure your choices are carbohydrate based and not protein based!
- The ideal ratio of carbohydrate to protein for recovery is 3-4:1 (3-4 g carbohydrate to 1 g protein). Examples of foods that meet these criteria are chocolate milk, fruit smoothie with yogurt, bagel with peanut butter, spaghetti with meat sauce, turkey sandwich with vegetable juice, fruit and nut trail mix, and some commercial recovery products.
- How much should you consume after a tough workout? Aim for 1 g/kg body weight of carbohydrate (remember: kg = weight (lbs) / 2.2) plus 15-25 g protein. If you weigh 150 pounds (68 kg), you need about 68 g carbohydrate plus 15-25 g protein after your workout. That's equivalent to a cup of chocolate milk and a small peanut butter and jelly sandwich.



All About Supplements

The following table lists some popular supplements along with explanations on how they might impact athletic performance, their safety, and effectiveness.

SUPPLEMENT	WHAT IT IS	PERFOMANCE ENHANCER	EXPLAINATION	SAFETY/RISKS
Caffeine	Caffeine is a stimulant found mainly in coffee, tea and soda, but may also be found in pill form. It is touted as a muscle fiber activator and "fat burner," although the latter has not been supported by research.	Yes	Caffeine works by stimulating the central nervous system, resulting in heightened awareness and a decreased perception of effort. May be more effective in those who are caffeine naïve than in habitual users.	Seems to be safe, although adverse effects like high blood pressure, increased heart rate, GI distress, and insomnia may affect performance. The NCAA still bans the use of caffeine at high levels.
Whey Protein	High biological value protein derived from the liquid portion of coagulated milk. Purported benefits include increased muscle mass, strength, and faster recovery.	No more or less effective than food protein.	Amino acids found in whey protein enter the bloodstream faster than other types of proteins like casein. Though protein powder may be convenient, adequate protein for muscle performance, growth and recovery can be obtained through a well-balanced sports diet.	Seems to be safe for healthy athletes without latent or known kidney or liver disease. Daily protein intakes that exceed 2.5 g/kg/day put athletes at high risk for dehydration, low carb intake, excessive energy intake, and increased excretion of calcium.
Creatine	A naturally occurring compound found in muscles (meat). Fuel for intense bouts of exercise lasting < 10-30 seconds. Creatine may increase strength, endurance and muscle gain.	70-80% of athletes notice performance enhancement, but very sport specific.	Creatine supplementation appears to enhance muscle glycogen storage and influence protein metabolism.	Holds water, which means you have extra weight to carry around (may be counterproductive for sports where speed is important) May cause nausea, GI distress, muscle cramps, dehydration Only fully developed athletes should take creatine.
Sodium Bicarbonate	Sodium bicarbonate is commonly known as baking soda.	Yes (in large doses)	Sodium bicarb works by buffering the lactic acid that builds up in the blood. Large doses can improve performance in high-intensity exercise that lasts 1-3 minutes.	Known to cause nausea and diarrhea
HMB (betahydroxy beta methylbutyrate)	HMB is a byproduct of the essential amino acid leucine. It is promoted to enhance lean body mass and increase strength.	Evidence is inconclusive	HMB theoretically decreases protein breakdown following intense exercise, but the exact mechanism for how it works is unknown.	Seems to be safe in short term, but long term safety profile of HMB is not yet known.

**Important note: All supplements should be used with caution as they are not evaluated for safety and effectiveness by the FDA. Some supplements contain prohibited substances (like steroids and stimulants) that are not declared on the label.*

alcohol + ATHLETES

Alcohol can affect your performance by:

- Dehydrating your body of fluids.
- Depleting your body of minerals.
- Providing empty calories (all calories, no nutrients). These calories will likely be stored as fat, place added strain on the liver, and negatively impact athletic performance.
- Prolonging recovery. Consuming alcohol after exercise has been shown to decrease muscle regeneration and slow the healing process, making it more difficult to bounce back from injury and keeping you from performing at your best.
- Acting as a depressant. Alcohol affects your mind as much as your body, and can impair mental performance just as much as physical.

Research suggests that athletes should avoid alcohol for 72 hours before and after exercise to eliminate harmful effects on performance.

Remember, you are in control of what you eat. Eat a well balanced diet that includes foods from all the food groups.

The more colors you eat, the more nutrients you consume. Eat more steamed, baked and grilled foods and fewer fried foods.

Craving a dessert? Rather than try to resist and risk overindulging later, slowly enjoy a small portion to satisfy the craving.

A special thanks to Elizabeth Devine, MS, RD, LDN, ACSM CCES for researching and compiling information for this newsletter with the assistance of Christian Tams, UMass Nutrition Major, Class of 2011

Winner of thirteen national awards from National Association of College and University Food Services:

"Outstanding College and University Menu for Residential Dining"
in 2000, 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009

"Most Creative Nutrition Promotion"
2003, 2004, 2006, 2008

RESTAURANTS & INSTITUTIONS Ivy Awards

Go to our website:
www.umassdining.com
for more specifics to improve your eating habits